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VOLUME IV. WHOLE NO. 33.

THE West American Scientist.

JANUARY, 1888.

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THE WEST AMERICAN SCIENTIST.

VOL. 4. JUNE, 1888. No. 38

ARTIFICIAL FLOATING ISLANDS.

Artificial floating islands, as far as I know, are only found in some lakes of Mexico, where they are used for agricultural purposes, and in these floating gardens all vegetables grow very luxuriantly. So far the idea is not a new one, but it has never been carried out on a large scale.

Notwithstanding the tropical and sub-tropical climates would be more favorable to the vegetation on such islands, we think the temperate climate would also be suitable to it; hence, we wish to call special attention to this subject.

The islands can be made of large and powerful rafts of several layers, covered with earth, the latter with sloping sides, so that the center of the island forms a terrace; the slopes are covered with large pebbles to prevent the earth from being washed away by the action of the water. The rafts should be constructed in such a way that other ones could be easily attached to them by means of flat and broad bridges, so the several rafts or islands would gradually cover the lake or other sheet of water so far as should be desirable with regard to navigation; every raft being ready and covered with earth can be used at once as an island and prepared as a garden, or planted with trees.

The first raft should be fixed to the bottom of the lake by means of several anchors, every anchor must be brought at some distance from the raft so that the cable may be stretched as far as possible before it sinks down; in this way the raft will be immovable even in the severest storm, for the stretched cables of the anchors hold it on all sides. The latter are, however, unnecessary for the rafts afterwards enclosed by others and only to be used for the outside ones exposed to the force of the waves. But the anchors should not be spared as it is the only way to secure the firmness of the whole. To prevent any accident by ice they should be fastened *under* the rafts.

Of course the sort of wood used must be most durable, and the earth-layers thick enough for the cultivation of shrubs and trees. There would be also no difficulty in building wooden houses on the rafts, but they should be firmly attached to it; in this way villages might be formed where there is now only water. The height above the level of the water must be the same for all

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royal Sirius, undisputed king of all the fixed stars. The western Zodiacal region was faintly luminous with that great cone of light so plainly seen at this season of the year, extending past the three stars of The Ram, almost up to the twinkling Pleiades. The other parts of the constellation, Taurus, were high up near the zenith, the most conspicuous star being the red Aldebaran. The Twins followed closely, and near the faint cluster of stars which mark the place of Cancer was seen the bright planet Saturn. To the east of this was the great sickle of Leo, and the last star of that constellation, Denebola, had just showed itself above the eastern hills. On the north were the ever-present attendants of the pole, Ursa Major, Cassiopeia and the minor constellations, while very near the zenith shone the circle of Auriga, with its star of the first magnitude, the bright Capella.

Having taken this general survey, a sight which is open to the observation of every one who is blessed with sight and who can view the open sky, we uncovered the great eye of the telescope and pointed the instrument toward the well-known nebula in Orion. We applied a low power, to give a broad field and plenty of light, and then we looked in silent admiration. Filling the whole circle of vision was a misty, luminous cloud, brighter near its center, and extending on either hand into fading wisps of light, which seemed to lie upon the dark sky like scatterings of white down. On the right side was a wide gap in the nebula, and the striking contrast between light and darkness made the sky behind this gap look like an inky space, deep and desolate. Several bright stars shone out in the midst of the nebula; one group of four, which seem very close together, is called the Trapezium. Under favorable circumstances two others are seen in this group, and lately, by the aid of the great telescope on Mt. Hamilton, a seventh has been observed.

From this, the most beautiful of nebulæ, it was easy to turn to Sirius, the grandest of the stars. As the tube came nearly into line with the beams of light which have for many months been hastening hither from that tremendous sun, lo, a bright dawn filled the field of the telescope! And then the orb itself shone out—brighter, keener, infinitely more full of white, hot energy than the electric light. Flashing, various and changing colors, splendid with the sharpest light conceivable, brilliant and lustrous as a diamond of the purest water, this magnificent star is doubtless the chiefest gem of all the sky.

The planet Saturn next claimed our attention, and in it we found a less brilliant, but equally beautiful object for observation. To the naked eye it appeared as a bright yellow star, but in the telescope we saw a luminous globe, surrounded by a shining ring a little inclined to our line of vision, so that it looked like a narrow ellipse. Steady and quiet, without the flashing splendor of Sirius, it shone in tranquil beauty, a mighty planet, surrounded by a

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brilliant halo, such as the old painters placed around the head of the Holy One.

Having now examined the three most beautiful objects in the evening sky, we left the observatory for a few hours, till the rolling earth should bring into view new scenes of interest and beauty.

[TO BE CONTINUED.] *Josiah Keep.*

THE WEST AMERICAN MUSEUM.

It is considered advisable at this time to place a brief statement before the people of San Diego, and others who may be interested, relative to the plans of an institution that is soon to be organized and that is to have its existence in this fair city. Correspondence and consultations have been carried on confidentially with some fifty interested parties during the past few months. Very flattering encouragement has been received as the result. It is now desired to effect immediate organization; to facilitate the necessary preliminary work before incorporation a brief outline of the proposed institution is presented, that its friends may come forward and co-operate with us in the work.

OBJECT.

A Museum should contain the results of researches, should be a custodian of records and preëminently it should be a factor in public education. Indispensible adjuncts to a Museum are libraries, laboratories for the prosecution of original investigations by specialists, schools for the training of its own workers in the best methods known, and the publication of the results of its works and discoveries.

The work of the Museum is not intended to consist merely in the forming, preservation and accumulation of material (which is the ostensible aim); it is also intended to aid in the increase and diffusion of knowledge, to secure as complete data relative to each object as possible, and a new fact should be more highly prized than simple additions to the cabinets without corresponding additions to our knowledge.

The forming of collections is of inestimable value in facilitating the study of nature, science and history, and cannot well be overestimated, but it need not necessarily interfere with, or preclude equally important matters.

SCOPE.

It is not proposed to limit the scope of the Museum in any way. Its immediate field consists of the west coast of the American continent, extending from Alaska to Cape Horn. Arrangements are being made for the forming of large and exhaustive collections representing the fauna and flora, natural resources, pre-historic remains, etc., etc., of the two Americas.

Original investigations and extensive explorations will be con-

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ducted at an early day, it is hoped, especially throughout interior Mexico, Central America and elsewhere.

The very comprehensive plan of the proposed Museum, if carried to completion, would rival any Institution in America, not even excepting the U. S. National Museum, in charge of the Smithsonian Institution. But such results require time for maturity. 'All things are possible' is an Arabic saying, and the little collection displayed on a tea plate a dozen years ago, grown to its present proportions, may yet rival the accumulation of ages under the genial skies of California.

THE ORCUTT COLLECTIONS.

The C. R. Orcutt Miscellaneous Collections will naturally be incorporated into and form the nucleus of the West American Museum of Nature and Art. These collections are estimated to contain over one thousand specimens, and are largely representative of the fauna and flora and other natural resources of Southern and Lower California. The herbarium is very complete; so also are the series of shells, fossils, minerals, etc., etc.

In addition to the plants of this region the herbarium contains plants from the Eastern States and Europe. The display of native grasses of San Diego and vicinity, awarded a diploma at the First Horticultural Fair held in San Diego, forms a portion of the herbarium and one feature of the Department of Economic Botany of the proposed Museum.

The Forestry Department, also connected with the Division of Botany, will be a special feature of the Museum, and it will be our policy to develop the local resources especially, after the plan of the Jessup collection in the American Museum of Natural History, of New York City. A fine series of wood sections of California, Eastern and West Indian trees and shrubs (also awarded a diploma at the first Horticultural Fair held in San Diego), and to which many additions have lately been made, forms a nucleus for this section of the Museum. The above series of woods is supplemented by a great variety of nuts and seeds from various parts of the world.

The work of the Department of Economic Botany will also include the introduction and distribution of seeds and plants, which will form a very important feature and materially aid in the establishment of a botanic and experimental garden in connection with the Museum. The wholesale seed and plant business, which has been conducted by C. R. Orcutt during the last eight years, will greatly facilitate the carrying out of very comprehensive plans relative to this work, and will render this department self-supporting should it be considered necessary or desirable by the management that it should yield an income.

THE LIBRARY.

An indispensible adjunct to a Museum is a library. At the present time, Pacific Coast students are compelled, in their prose-

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cutions of original biological investigations, to consult Eastern, and in many cases, European libraries, from the lack of any libraries of note in California of a scientific character.

A feature that should be prominent in every library is the preservation of local history. No library is nearly complete without complete files of all the newspapers, magazines, and posters, and circulars, as it is possible to secure. Every book or other publication, containing even the slightest reference to the region, should be preserved, and especially all Government reports and scientific papers—often fugitive essays in foreign papers or magazines, or in the proceedings of some society far removed. These papers are often indispensable to the historical or biological student to avoid error, incompleteness and injustice to others in his own work.

The library of C. R. Orcutt contains some thousands of scientific books, pamphlet, stray papers, files of newspapers, and the files of scientific and other exchanges of the WEST AMERICAN SCIENTIST, which is being continually added to through various exchanges and purchases. In some respects the collection is unique and could not well be duplicated without great expense and trouble. Among the older volumes are two bearing the date of 1771. Some of the scientific books are valued as high as $40.00 for a single volume.

PUBLICATIONS.

THE WEST AMERICAN SCIENTIST will continue to be published monthly, and become the organ of the Museum. The influence of the magazine will be greatly to the advantage of the Museum at the start, and the exchanges with other magazines, individuals and societies, and literature received for review will very materially augment the library.

It will doubtless be found desirable to issue other series of publications such as bulletins, annual reports, memoirs, etc.; but these will not be immediately necessary. It will be best to establish a liberal system of exchanges throughout the United States and Europe, this often being the only way of securing invaluable publications of some foreign institutions.

EXCHANGES.

In addition to a system of exchanges of publications it will be necessary to arrange to exchange with other American institutions and individuals and foreign societies, sending them specimens of our plants and animals, minerals and fossils, in return for which they will gladly send us series for their own countries.

ORGANIZATION AND GOVERNMENT.

It is proposed to incorporate at an early date, under the laws of the State of California. The government of the Museum will be in the hands of a Board of Regents, consisting of ladies or

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gentlemen chosen especially for their services in the cause of science, and who therefore seem suitable for the position. The number of Regents shall not exceed twenty-five at one time.

The general management and executive work of the Museum will be in the hands of the Director, who shall be responsible only to the Board of Regents, of which he shall be a member.

THE MUSEUM STAFF.

In addition to the officers and regents of the institution, there are more than a score of young men ready to enter the service of the Museum in any capacity, willing virtually to give their time to work. These stand ready to enter the field in making explorations and collections in any region we may designate as soon as we can guarantee their nominal expenses.

'It will not do to neglect nor slight these offers of services,' writes a friend of the institution, 'so willing to work hard and fare poorly, and with so good character and aims. These young men seem raised up for our work, and ready to give good aid from the start, and willing to do anything.'

We hope to receive sufficient encouragement and financial aid to very shortly avail ourselves of these offers of assistance and service which we have received from men of ability and experience—some even of national renown.

Further statements will be made in the near. A block of land valued at $20,000.00 has been donated for the site of the proposed Museum. Other donations of land, money, books or specimens will soon be in order.

THE TEA ROSE CRAB.

In 1862-3 this tree, Pyrus Malus Parkmanii, was received from Japan, by the late Col. Francis L. Lee, and by him given to Dr. Francis Parkman, in whose delightful garden it stands to-day. It is about 12 feet high, and full as wide, and has an exceedingly dense head of fine branches, resembling in its habit of growth a fine thorn. It has a remarkable habit of flowering the whole length of the past season's growth as well as from the older spurs, and each bud produces regurlarly five blossoms. These are set on stems three inches long, and so slender that they bend with the weight of the bud or bloom, in a very graceful fashion. The buds themselves are of a rich carmine color, and are in shape exactly like a choice tea-rose bud, only more slender, while full as long. They are almost precisely like, in color and form, the new tea rose Pere Gontier, only not so large. This is a point of great importance in looking for a perfect apple blossom, as all others so far known, have the ends of the buds blunt and ill-formed. The fully opened blossoms are semi-double and of a lighter carmine color than the buds. The foliage is narrow, wedge-shaped, very firm, and quite glossy, being curiously dis-

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tinct from all others of the apple family, and takes on in autumn the richest crimson and orange colors. The whole tree is a rich cloud of carmine colors, and the superb gracefulness of the whole is indescribable.

We are indebted to the Shady Hill Nurseries, Cambridge, Mass., for the beautiful illustration of this crab presented our readers this month. It is being introduced and is for sale by them. Our readers are advised to send them their address for their new catalogue containing colored plates of various novelties.

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A NEW ROSE-GALL.

A spherical gall, an inch or more in diameter, is very frequent on the wild rose in this neighborhood. (Swift Creek, Custer Co., Colo.) Its surface is somewhat shiny, usually corrugated, in color reddish-yellow varying to pink and dull purplish. It grows surrounding the rose twig, so that it projects beyond and from the middle of the gall. In an old gall, from which most of the insects had escaped, I was fortunate in finding a dead and somewhat imperfect specimen of the imago, which is about three millimeters long, almost black, and shiny, with reddish legs and somewhat fuscous wings. I sent some of the galls to the Department of Agriculture, and Mr. L. O. Howard informs me that they are the product of Rhodites tuberculator Riley, Ms., an undescribed species. *T. D. A. Cockerell.*

WEST CLIFF, COLO., March 12, 1888.

A NEW UNIO.

BY S. HART WRIGHT.

UNIO ORCUTTII (Sp. novo). Shell oblong-ovate, inequilateral, not attenuated posteriorly, abruptly jointed behind, and sometimes slightly biangulated there, in front evenly rounded, basal margin gradually convex, and often nearly straight, dorsal margin nearly straight, or moderately arched. Epidermis variable, olive-brown, or olive-yellow, or reddish-brown, with many faint green rays in fascicles, and three or four zones of growth, of darker color on the dividing lines. Surface smooth and often shining. Umbo obtuse, depressed, and slightly raised above the dorsum. Umbonial ridge much depressed and very obtusely rounded. Posterior slope depressed, scarcely carinated, descending steeply and in nearly a straight line to the joint, which is carried up to the transverse axis. Cicatrices distinct, well impressed, those of the dorsum are over the umbonial cavity. Cardinal teeth short, erect, summits divaricate, granulate, firm.

Lateral teeth slightly curved, arising from the cardinal tooth, acicular at extremity, and groove deep. Nacre a livid-white, copper-colored, or brilliant salmon, or purple, and chocolate colored. Cavity of beaks shallow. Habitat, Manatee River and west coast of Florida (C. T. Simpson), and in Lake Miakka, Florida (Dr. W. Newcomb).

In cabinet of Academy Natural Sciences, Philadelphia, National Museum, and Cornell University. Width 2.35, length 1.5, diameter 1 inch.

Observations. The affinity of this species is with U. Geddingsianus, Lea, but is more oval than the latter. It is with pleasure we dedicate this species to Mr. Charles R. Orcutt, a working conchologist of San Diego, Cal.

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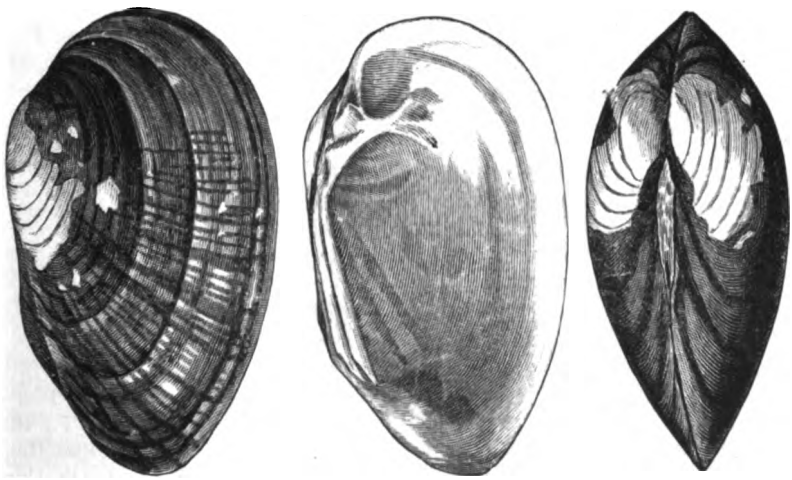

UNIO ORCUTTII.—S. HART WRIGHT.

FLORIDA.

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SCIENTIFIC MISCELLANY.

(Compiled by Maurice Lopatecki.)

The belief that human beings should sleep with their heads to the north is said to have its foundation in a scientific fact. The French Academy of Science has made experiments upon the body of a guillotined man which go to prove that each human system is in itself an electric battery, one electrode being represented by the head, the other by the feet. The body was taken immediately after death and placed on a pivot, to move as it might. After some vacillation the head portion turned toward the north, the body then remaining stationary. One of the professors turned it half way around, but it soon regained its original position, and the same result was repeatedly obtained until organic movement finally ceased.

The mean height of the land above sea level, according to John Murray, is 2,250 feet, and the mean depth of the ocean is 12,480 feet. Only 2 per cent. of the sea is included inside a depth of 500 fathoms, while 75 per cent. lies between 500 and 3000 fathoms. If the land were filled into the hollows, the sea would roll over the earth's crust to a uniform depth of two miles.

Tigers have lately been reported from two extremes of Siberia —Vladivostock, upon the Japan Sea, and a point to the north of the Caspian Sea. They have long been known in the Chinese forests near Vladivostock, but their appearance in the region of the Caucasus is quite remarkable.

Australia has some giant caterpillars. Mr. A. S. Olliff, of Sidney, mentions one moth larva, abundant during the past season, as being seven inches long, and specimens of larvae of two other species measure eight inches in length.

Occultations of stars and planets are extremely rare, but Dr. Berberich of Berlin, believes observations of them would be very important, throwing light on the extent and density of planetary atmospheres, and in the case of Mars and Venus affording a means for the determination of parallax and diameter.

Mr. E. M. Hasbrouck asserts that ten species of North American birds can be regarded as missing. Of those, two—the great auk and the Labrador duck—are believed to have become extinct, while the following eight, through scarcity or diminutiveness, were 'lost' with the taking of the first specimens, and are now being eagerly sought. The carbonated warbler, blue mountain warbler, small headed warbler, Cuvier's kinglet, Townsend's bunting, Brewster's linnet, Bachman's warbler and the Cincinnati warbler.

The direct conversion of heat into electric work is a problem that continues to tax the ingenuity of the electricians. What seems to be the most promising attempt at solution yet made is a

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new thermo-magnetic generator and motor devised by M. Menges, of Hague. Like the recent pyro-magnetic dynamo of Edison, it depends on the fact that the magnetic metals lose their magnetic power when heated. It claims several important advantages, however, the chief being that the necessary alterations of heating and cooling are given automatically, and that the cores of the armature coils are relieved from changes of temperature.

Considerable differences in the standard barometers of the principal European observatories have been found by Mr. E. A. Sundell, of the Scientific Society of Finland.

The shadow of the total solar eclipse of last August was fifty-six times as bright as the light of the full moon, as estimated by the time required to photograph a landscape

The government of Egypt has been pursuaded to make surveys which prove the existence of a depressed region nearly sixty miles long by twenty miles wide, reaching a depth of 250 to 300 feet below high Nile. This depression has for several years been held by Mr. D. Cope Whitehouse to be the site of the wonderful artificial Lake Moeris described by Herodotus—fictitiously, many have believed—with a circumference of 450 miles. The interest at last aroused in Egypt makes it probable that the Nile will soon be admitted to this valley by a canal eleven miles long. The creation or restoration of this great artificial lake will give fertility to a wide area, and will reduce the annual inundations of the Nile, while storing water to replenish the river in dry seasons.

TERMS USED IN TALKING TO DOMESTIC ANIMALS.

EDITORS OF THE WEST AMERICAN SCIENTIST:—In controlling the movements of domestic animals by the voice, besides words of ordinary import, man uses a variety of peculiar terms, calls and inarticulate sounds—not to include whistling—which vary in different localities. In driving yoked cattle and harnessed horses teamsters cry 'get up,' 'click click' (tongue against teeth), 'gee,' 'haw,' 'whoa,' 'whoosh,' 'back,' etc., in English speaking countries; 'arre,' 'arri,' 'jüh,' 'gio,' etc., in European countries.

In the United States 'gee' directs the animals away from the driver, hence to the right, but, according to Webster's Dictionary, in England the same term has the opposite effect because the driver walks on the right hand side of his team. In Virginia mule drivers gee the animals with the cry 'hep-yee-ee a;' in Norfolk, England, 'whoosh-wo;' in France, 'hue' and 'huhaut;' in Germany 'hott' and 'hotte;' in some parts of Russia 'haitä,' serve the same purpose. To direct animals to the left another series of terms is used.

In calling cattle in the field the following cries are used in the localities given: 'boss, boss' (Conn.); 'sake, sake' (Conn.); 'coo,

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coo' (Va.); 'sook, sook,' also 'sookey' (Md.); 'sookow' (Ala.); 'tloñ, tloñ' (Russia); and for calling horses, 'kope, kope' (Md. and Ala.); for calling sheep, 'konanny' (Md.); for calling hogs, 'chee-oo-oo' (Va.).

The undersigned is desirous of collecting words and expressions (oaths excepted) used in addressing domesticated animals in all parts of the United States and in foreign lands.

In particular he seeks information as to:

1. The terms used to start, hasten, haw, gee, back and stop horses, oxen, camels and other animals in harness.

2. Terms used for calling in the field: cattle, horses, mules, asses, camels, sheep, goats, swine, poultry, and other animals.

3. Exclamations used in driving from the person, domestic animals.

4. Any expressions and inarticulate sounds used in addressing domestic animals for any purpose whatever (dogs and cats).

5. References to information in works of travel and general literature will be very welcome.

Persons willing to collect and forward the above mentioned data will confer great obligations on the writer; he is already indebted to many correspondents for kind replies to his appeal for the *Counting-out Rhymes of Chilaren*, the results of which have been published in a volume with that title. (Elliot Stock, London.)

To indicate the value of vowels in English please use the vowels-signs of Webster's Unabridged, and in cases of difficulty spell phonetically.

All correspondence will be gratefully received, and materials used will be credited to the contributors.

Yours truly,

H. Carrington Bolton.

NEW YORK CITY. University Club.

EDITORIAL.

We present a preliminary statement in this issue of The West American Museum of Nature and Art. which will probably be an incorporared institution by the time this reaches our readers. The importance to be attached to the proposed establishment can hardly be over-estimated, and we hope to receive the assistance and co-operation of every scientist on the coast. The proposal has thus far met with most unqualified approval from leading men which is quite gratifying to us and we look forward to the complete success of the undertaking, vast as its scope surely is.

We have to acknowledge the compliment paid us in this number by Dr. S. Hart Wright, the well-known botanist and conchologist, who dedicates a new Unio from Florida to the editor—a courtesy which we appreciate.

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SCIENTIST?' 'The end of Vol. IV would be a good time; then people could bind their volumes,' suggests the last postal on the subject. Yes, we hope to find time to prepare a complete index and a title page will accompany it, but, while we agree that it should appear with the end of this volume, we fear that it will be delayed until Vol. V appears.

M. Buysman, of Holland, contributes this month an article on artificial floating islands. The ideas presented are not of practical value to San Diego, but they suggest a possibly feasible way of providing Los Angeles with an artificial harbor near home and of which they would do well to take notice.

We have received of Edgar Cherry, of Santa Rosa, Calif., a few choice specimens of petrified wood, found in the foothills near that place.

Where is Mount Diablo, of San Diego county, located?

Do you know of any place near you where fossil bones or shells are found?

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Helix.

$ ..absolena, Bourg.
.15..acenpsia, Bourg.
..acies, Part.
.05..acuta, L.
..adolphi, Pfr.
.15..a'abastrites, Mull.
.10..albolabris, Say.
.15..algirus, L.
.05..alternata, Say
.25..amanda, Morel.
.15..aperta, Born.
.10..apicina, Lam.
.10. appressa, Say.
.25..arangiana, Say.
.05..arborea, Say.
.15. arbustorum, L.
..argia, Bourg.
.25..arcolata, Fbs.
..arradica, Parr.
.20..arrosa, Gld.
.15..aspersa, Mull.
.20..asteriscus, Morse.
..atlasiae, Mousson.
.25..aureolenta, Beech.
..auricoma, Parr.
.10..austriana, Ofan.
.10 .var. expallescens.
1.00..ayresiana, Newc.
.10..barbarea, L.
..var. ——
.15..bermudensis, Pfr.
.75..bipartita, Fer.
1.00..bridgei, Newc.
.25..bucculenta, Gld.
.15..californiensis, Lea.
..calendyma, Bourg.
..var. B.
.10..canalicans, Ziegl.
.10..candidissima, Drap.
.05..cantiana, Montague.
.05..caperata, Montague.
.10..carinula, Bourg.
1.00..carpenteri, Newc.
.10..carpenteriana, Bland.
.05..carthusiana, Mull.
.05..cellaria, Mull.
..certiculus, Gund.
.05..cespitum, Drap.
.10..clausa, Say.
..claustralis, Ziegl.
..cicatricosa, Mull.
2.00..circumcarinata, Stearns.
.05..ciliata, Ofan.
.35..citrina, L.
.50..var. ——
.50..var. ——
.20..cobresiana, Fer.
.15..columbiana, Lea.
.05..concava, Say.
.05..concinna, Jeffreys.
.15 conoidea, Drap.
.20..conspecta, Bland.
..constantinae, Bourg.
..cooperi.
..cornea.
.10..costata, Mull.
..cretica, Fer.
.10..crystallina, Mull.
..cumberlandiana, Lea.
..cunninghami, Gray.
.25..dupeti houarsi, Desh.
..dentifera, Say.
.15..denudata, Rossm.
..depressula, Parr.
..desertella, Zick.
.15..desertorum, Fors.
.10..devia, Gld.
..edwardsi, Bland.
..ehrenbergi.
..var. chilenbia, Bourg.
.05..electrina, Gld.
.15..elevata, Say.
.05..ericetorum, Mull.
.20..euphorca, Bourg. var.
..eustilbus, Bourg.
.25..exarata, Pfr.
.05..exoleta, Binn.
. explanata, Mull.
.50..facta, Newc.
. falconeri, Rve.
.05 .fallax. Say.
..faustina, Ziegl.
.20..fidelis, Gray.
.20..fleurati, Bourg.
..friabilis, W. G. Binn.
.10..fulginosa, Griffith.
.05..fulva, Drap.
.20..gaberti, Lesson.
..globularis, Ziegl.
.25..godeffroyana, Garr.
..guamensis, Gay.
.10..gularis, Say.
.25..haemastoma, L.
.25. heripensis, Mab.
. hopetonensis, Shuttl.
.05..hortensis, Mull.
.10..var. ——
.15..hoyti, Garret.
.20..hieroglyphicula, Michaud.
.10..hirsuta, Say.
.05..hispida, L.
.05..inflecta, Say.
1.00..infumata, Gld.
..imperator, Mont.
.10..inornata, Say..
.05..interna, Say.
.10..intersecta.
.10..jejuna, Say.
..josephinae, Fer.
.15..kellettii, Fbs.
.05..labyrinthica, Say.
..laevigata, Pfr.
.25 laevis, Pfr. (sub-fossil).
.25..lais.
.50..var. ——
.25..lanta, Lowe.
.25..var. ——
.05..lapicida, L.
..launcestonensis, Rve.
..lefeburiana, Fer.
.25..levis, Pfr.
.10..ligera, Say.
.10..lineata, Say.
.10..lineata, — —
..locheana, Bourg.
..lombei, Pfr.
.10..loricata, Gld.
..macgregori, Cox.
..mandarina, Fer.
.15..marginata, Mull.
.05 .maritina, Drap.
.10 .melanostoma, Drap.
..metaformis.
.10..milleril, Pfr.
.05..minuscula, Say.
.35..mirabilis, Fer.
.10..mitchelliana, Lea.
.05..monodon, Rackett.
.05..var. lesil.
.10..mozambicensis, Pfr.
.05..multidentata, Binn.
.05..multilineata, Say.
.10..muscarum, Lea.
.15..var. ——
.20..nemoralina, Petit.
.10..nemoralis, L.
1.00..nicklliniana, Lea.
.20..nigritella, Pfr.
.50..newberryana, Binn.
.05..nitida, Mull.
10..nitidula, Dyr.
..nivosa, Shy.
.50..novachibernica, Quay.
..nucula, Parr.
..obstricta, Say.
.05..obvoluta, Mull.
.10..palliata, Say.
..paludora, Pfr.
..parraiana, Orb.
pellita, Fer.
.10..pennsylvanica, Green.
..perphysia, Pfr.
..personata, Lam.
.05..perspectiva, Say.
..philammia. Bourg.
.15..physalis, Pfr.
.20..picta, Born.
.05..pisana, Mull.
.15..planospira, Rossm.
..plebeia.
.10..polygyra, Say.
.20..pomatia, L
..poupillieri, Bourg.
..proboscidea, Pfr.
.15..profunda, Say.
.20..provisoria, Pfr.
..psammita, Bourg.
.20..psara, Bourg.
..puella.
.05..pulchella, Mull.
.10..pustula, Fer.
.10..cereolus, Muhlf.
..rufocincta, Parr.
.20..pyramidata, Drap.
.20..var. ——
.25. ramentosa, Gld.
.25..rariguttata, Mousson.
..roemeri.
.05..rotunlata, Mull.
.05..rufescens, Pennant.
..rufuapicata, Parr
.10..rugell, Shuttl.
.05..rupestris, Drap.
.15..sabulosa, Hazay.
..sayii, Binn.
.10. septemvolva, Say
..sequoicola,
.10..serpentina, Fer.
..soconensis, Pfr.
.10..solitaria, Say.
.25..spinosa, Lea.
.05..splendida, Drap.
..sportella.
.15..stearnsiana, Gabb.
.50..var. ——?
.05..stenotrema, Fer.
.05..strigella, Drap.
.05..striatella, Anthony.
..squlus, Hds.
.10..syriaca, Ehrenb.
.20..traskii, Newc.
..var. depressa.
.10..terrestris, Chem.
..terverii.
.15 .texasiana, Mor.
..thayxix, Bourg.
.05..thyroides, Say.
.25..townsendiana, Lea.
.10..tridentata, Say.
..trigona, Zegl.
.10..trochiformis, Fer.
.25..trollus, Gld.
.15..troostiana Lea.
.15..troschelli, Pfr.
.25..tudiculata, Binn.
..tucanensis, Pfr.
..umbrosa, Part.
.15 .uvulifera, Shuttl.
.20..var. ——?
.20..vancouverensis, Lea.
.05..variabilis, Trist.
.15..varians, Mke.
.20..var. ——
.20. var. ——
.15..vermiculata, Drap.
.25..verticillus, Fer.
.10..virgata, Da Costa.
..viridula, Mke.
.25..vittatta, Mull.
.05. volvois, Parr.
.25..zonaria, L.
..————?

Stenogyra.

.10..gutierri, Arango.
.10..junceus, Gld.
.10..octona, Chem.
.10..octonoides, Ad.

Succinea.

.05..campestris, Say.
.10..elegans, Risso.
.15..haydeni, W. G. B.
.20..higginsii.
.10..luteola, Gld.
.05..obliqua, Say.
.10..ochracea, Botta.
.10..oregonensis, Lea.
.15..pleuralaca, Let.
.05..putris, L.

Vitrina.

.25..latissima.
.05..limpida, Say.
.10..pellucida, Mull.
.50..thomsoni, Brazier.

Megalomastoma.

..apertum, Payr.
..mani, Payr.

Trochatella.

.25..regina, Mer.
.25..var ——
.25. var.——
.25..subunguiculata, Payr.

Helicina.

.25..acuminata, Velr.
.25..blandiana, Gundl.
..columellaris, Gundl.
.25..lucida,
.25..mestrei, Arango.
.15..musiva, Gld.
..nuda, Arango.
.05..occulta, Tryon.
..orbiculata, Say.
..pugulata, Poey.
..remota, Poey.
.10..sagraiana, Orb.
..tectiformis, Mona.
.10..uberta, Gld.

Achatina.

.05. acicula, Mull.
..fasciata, Mull.

Achatinella.

.15..abbreviata, Rve.

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and author of many works on that subject. Prof. Keep contributes a brief sketch of his life in this number.

We are indepted to our talented friend, Maurice Lopatecki, for several interesting articles on the natural history of British Columbia, and also to Dr. L. G. Yates and T. D. A. Cockerell, for valuable contributions.

We are far behind in giving literary notices, but will soon be able to make due acknowledgements and reviews of those deserving.

CLOSE OF THE CENTURY'S 35th VOLUME.

The April number of THE CENTURY closes the thirty-fifth half-yearly volume. The first article is by Edward L. Wilson, the well-known photographer, and is descriptive of the natural and other features of Palestine 'From Dan to Beersheba.' The article has a great number of illustrations, mainly from photographs, and will be of special interest to the teachers and students of the International Sunday-School Lessons.

Theodore Roosevelt, in this number describes, with the aid of Mr. Remington's well-informed pencil, that decidedly American institution, 'The round-up' As Mr. Roosevelt and Mr. Remington have both participated in scenes such as are here depicted, the paper is unusually vivid both in letter-press and illustrations.

An illustrated article on 'The American Inventors of the Telegraph' tells the inside story of the invention, especially bringing out the services rendered to the enterprise by Alfred Vail. Mr. Vail's extremely important connections with the invention is here for the first time fully and authoritatively told. The article will be a surprise to the larger part of the public.

Two articles of special literary interest are Henry James's paper on Robert Louis Stevenson, with a sketch of Stevenson's very individual face by Alexander, and a brief essay by the Rev. T. T. Munger on 'The Works of Elisha Mulford.' Mr. James does not speak of 'Underwoods' in his essay, it having appeared since the paper was written; but there is a poetic criticism of it in 'Bric-a Brac,' by Miss Thomas.

Dr. Eggleston's story of 'The Graysons' has some very exciting chapters, and James Lane Allen's story, illustrated by Kemble is a pathetic account of 'Two Kentucky Gentlemen of the Old School.'

ST. NICHOLAS FOR APRIL, 1888.

The April ST. NICHOLAS has a seasonable frontispiece by Fenn, two toddlers under an umbrella, on 'An April Day.' This introduces the opening article 'What Makes it Rain?' by George P. Merrill. There is also a charming 'Rhyme for a Rainy Day' by Julia M. Colton, artistically framed by Katherine Pyle.

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70	Common Tern	3	04
80	Black Skimmer	4	08
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122	Brandt's Cormorant	3 4	25
123b	Baird's Cormorant	3	25
199	Louisiana Heron	3 4	08
201	Green Heron	4	05
221	American Coot	5 6 7	05
316	Mourning Dove	2	02
378	Burrowing Owl	5 to 10	15
385	Road Runner	4	15
413	Red Shafted Flicker	5 6	05
444	Kingbird	3 4	03
448	Cassin's Kingbird	3 4 5	20
495	Cowbird	1	03
498	Red-winged Blackbird	4	02
508	Bullock's Oriole	4 5	08
510	Brewer's Blackbird	4 5	04
519a	Crimson House Finch	4 5	04
581	Song Sparrow	4 5 6	02
591b	California Towhee	4	05
593	Cardinal Grosbeak	3	04
622a	White-rumped Shrike	4 5	04
703	Mockingbird	4	04
704	Catbird	4	02
713	Cactus Wren	4 5	08
721a	Parkman's Wren	5 7 8	04

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1825 " " "	20
1827 " " "	15
1828 " " "	20
1831 " " "	10
1832 " " "	10
1833 " " "	10
1834 " " "	05
1835 Head 1834	10
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1838	08
1840	08
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1868 Bronze, Indian Head	08
1880 " " "	05

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"NOTHING SUCCEEDS LIKE SUCCESS."

(*Editorial from the Cosmopolitan, December, 1882.*)

Before those famous taxidermists and hunters, the Verraux Freres, established themselves in Paris, natural history museums were compelled to rely upon picking up their specimens in all parts of the world. The keen intelligence of the Verraux Bros. was not long in discovering a means of serving the cause of science and of advancing their own fortunes at the same time. They established a sort of clearing-house for wild beasts, birds, fishes, and reptiles, with branches in every quarter of the globe, and from whom you could order a stuffed elephant, giraffe, a Bengal tiger as you would flitch a bacon from your butcher, or a boiled lobster from the fish-monger.

While the Verraux Freres were gaining a world-wide reputation, an American lad, William H. Winkley by name, was pursuing his studies at the famous technical schools of the French capital, and, when his means were all but exhausted, he left his lodgings in the Latin quarter and apprenticed himself under these famous masters. After serving a long and laborious apprenticeship in the study of animal forms, anatomy, and drawing, he considered himself sufficiently equipped for the practical work of his vocation Returning to America, and selecting a small interior town where rents and living expenses were light, he set up anestablishment of his own, as large as his limited means would allow.

To-day, he supplies the largest museums of the world with stuffed specimens from the elephant down to the smallest rodent, besides large quantities of minerals, rocks, fossils, casts of fossils, skins, and skeletons (unmounted) of animals of all classes, and often the wild animals themselves, alcoholic specimens, insects, crustaceans, shells, echmoderms, corals, sponges, and botanical specimens, from every quarter of the globe and in a great variety of form and price. Also anatomical preparations, chemical, philosophical and optical instruments, with Naturalists' supplies of every description, and, the Verraux Freres being now dead, he has established, as they did, stations upon every continent for the collection of natural history specimens. The attaches of all the stations are over 100 in number, many of whom are specialists.

At his American headquarters at Clearfield, Iowa, there are not far from 100,000 specimens of all classes. Besides mounting the skins sent in by his own collectors, this eminently successful taxidermist takes custom work in his department from those desiring the same, and many hundreds of persons and museums throughout the civilized world are constantly sending him mammal and bird skins and skeletons for restoration. Especially is this true of those scientific persons and wealthy individuals, who, while abroad, have shown prowess in the hunt.

But it is not alone in taxidermy that this cosmopolitan naturalist has won an unrivalled reputation. Years ago he devised a plan whereby even those of moderate means could possess a good cabinet. This, the installment plan, has from the start been a success, and in hundreds upon hundreds of cases has proven itself an inestimable boon to those of moderate means who desire a good collection. Many of the best collections in this country have been obtained entirely upon this plan and students, professional men, schools and colleges have all expressed themselves perfectly satisfied with its workings in their respective cases.

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This unsolicited editorial was written more than seven years ago. In the interim we have grown considerably, and to-day stand at the head of the museum furnishing business in the world. We are the only house outside of Paris, that sells collections on installments. Do you want to secure a good collection on easy terms? If so, write to us.

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VOLUME VI. APRIL. 1889. WHOLE NO. 42.

THE West American Scientist.

A popular review and record for the Pacific Coast.
Official Organ of the San Diego Society of Natural History.

C. R. ORCUTT, - - EDITOR.

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THE WEST AMERICAN SCIENTIST.

VOL. VI. APRIL, 1889. No. 42

CREMATION.

(Read before the San Diego Society of Natural History, March 1, 1889.)

BY GEORGE WILLIAM BARNES, M. D.

Having been asked for some expression upon the subject of cremation, I beg the privilege of submitting, briefly, a very few of the many and weighty reasons I have for favoring incineration in preference to inhumation of the dead.

First: reasons based on sanitary grounds are most potent. The earth is the most convenient depository for putting out of sight whatever is offensive or deleterious or cannot be tolerated above its surface. The soil is not, however, always destructive, but often preservative of the products o animal and vegetable decomposition. It is more than a probability that pestilential diseases are by earth-burial transmitted from one generation to another, and thus perpetuated indefinitely. If the seeds of plants can be preserved for centuries, and then under favoring conditions be made to germinate and reproduce their kind, so the germs of contagious disease after having been entombed for ages may be warmed into life under suitable environment, and spread contagion among the living. To this source may often be attributed the sudden outbreak of epidemics and the occurrence of forms of disease not previously known in the locality. Evidence is not wanting that bodies which had perished from infectious disease on being exhumed or the products of their decomposition disturbed many years after interment have communicated the same disease to the living.

A full acceptance of modern theories of germ ætiology need not be implied in the belief that from this Pandora's box or mummy dust a flood of evils may desolate the land.

If phosphorescent and gaseous emanations may ascend from decaying bodies through a considerable stratum of earth, whether harmless in themselves or not, they may be the vehicles for conveying the seeds of disease to the living. In view, therefore, of the frequency with which such products of decay are disturbed and brought to the surface by voluntary and accidental agencies there are the strongest reasons for the conclusion that the sum of human suffering and the records of mortality are largely swelled by these influences.

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Cemeteries are a growing evil and a danger. They encroach upon the domain of living men and their uses. They pollute the air and the water. One generation of men revels out its little life upon the earth, passes away and gives place to a succeeding one. But cemeteries seem designed to endure forever. Fifty millions of people in our own land walk the earth to-day. Where shall they be laid, and where the millions of the next succeeding generations? The moving tides of living humanity will be turned from their channels to give way to the advancing armies of the dead.

Says Sir Henry Thompson, "No dead body is ever placed in the soil without polluting the earth, the air and the water above and about it."

The experiments of Pasteur and others have shown that earthworms bring to the surface myriads of bacteria from the bodies of decomposing dead.

No successful means of counteracting these destructive agencies have been discovered. All known disinfectants are under some circumstances imperfect and unreliable, or of difficult or impossible application. Those upon which the greatest reliance has been placed are too often only deodorants. The only true disinfectant is fire. Correct principles of cleanliness require that filth likely to become dangerous which cannot be otherwise perfectly destroyed, should be burned. The value of this principle in the sanitation of cities, is so well recognized that methods are being introduced of destroying by fire garbage and all animal and vegetable substances liable to decay.

With the general adoption of cremation there would likely follow relief of one of the burdens of society in funeral reform. While there is nothing in the process of incineration of bodies calculated to detract from a becoming reverence for the "mold once hallowed by the Almighty's breath," it is calculated to detract in some degree from the superstitious reverence now prevailing for "this muddy vesture of decay which doth grossly close us in," the barren casket from which the gem—the man himself—has fled forever.

The method of cremation furnishes us with a residuum in the ashes derived from the actual substance of the body of the departed—a tangible memento—which may be inurned and preserved with all the care and reverence and adorned with all the beauty which a refined taste can suggest. The preservation of such a memento in the case of earth burial would be impracticable and most undesirable.

Every consideration of value is in favor of cremation. Objections to it are of sentiment and not of reason. They exist usually

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only in the minds of those who have scarcely contemplated the subject. In such minds it seems associated with the fagot, the funeral pyre and the rude processes of the ancients. In imagination the dead body is still endowed with sensation, and in the crematorium are kindled anew the fires of the inquisition. The modern method accomplished by suitable apparatus has so little similarity to those heretofore practiced as to constitute it a very different process. The latter is conducted with all due regard to the most tender sensibilities of the friends of the deceased, and though carried on in the midst of a densely populated neighborhood, and in the presence of such spectators as may be permitted to witness it, there is nothing in it to shock or offend the senses.

The body enveloped in a sheet saturated with a solution of alum or asbestos is placed by delicately acting machinery in a retort at white heat—2000° to 2500° Fahrenheit—and is quickly and beautifully diffused in the air without visible flame or vapor, all gases being consumed in the retort.

Contemplate for a moment the beauty of this transformation compared with the stages of slow decay, through which the buried body is compelled to pass in order to reach the same end, through oxidation, which, in either case, is a combustion by which it is returned "earth to earth, ashes to ashes and dust to dust." In the latter case we contemplate the forms of loved ones presenting spectacles too shocking to desire to witness or to permit the thoughts to dwell upon; the ghastly remains of poor mortality being even more repulsive by contrast with the pomp of funeral pageant and the gaudy trappings of the grave.

There is some force, it is admitted, in the objection, the only plausible one to cremation, that it would destroy evidences of crime which might be obtained by the exhumation of bodies. But instances are so rare of conviction of criminals brought about by evidence thus obtained that the preservation of bodies in the earth with their dangers to the living would hardly be justifiable on that account. In a portion of the instances in which poison has been detected in the exhumed body, it was impossible to determine whether it had been introduced into it before death or after it, to thwart the ends of justice. Notwithstanding official vigilance and the rigid application of legal processes, a very large proportion of the criminals of our country go unwhipped of justice. It were better that a few more should escape the penalty due to their crimes than that thousands of innocent children should perish.

Death should be robbed of all its terrors. The shabbiest of fears that weigh upon the minds of many who approach the dark valley are those of premature burial and body snatching. They may be dissipated as perfectly as can the body be.

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We might well exclaim with Goethe:

"O for the wise custom of the ancients to dissolve
The perfect, the sublime dignity of human form,
Which nature earnestly and slowly built,
After the spirit, the efficient has been severed,
By the action of purest flame.
O treasure up in a most precious urn
The dull remains of ashes and of bones,
That these arms, in vain extended,
May hold but something that unto this heart,
Which anxiously is yearning into empty space,
I still may press what is its melancholy own."

THE GOLD FIELDS OF LOWER CALIFORNIA.

The present excitement in San Diego, in fact throughout Southern California, over the reports of remarkably rich discoveries of gold in Lower California placer mines, will render any information on this subject of popular interest, even if not of real scientific value.

The gold belt of Lower California, if the whole of the peninsular is not to be included in a general way, may be said to extend from near the United States boundary, south along the mountains for two hundred or more miles, and an average of fifty miles in width.

The old Juarez district lies some forty miles southeast of Campo, and comprises many thousands of acres of auriferous land, only a few hundred of acres of which has been even partially worked or prospected. For possibly half a century these Juarez placers have been worked in a primitive way by Mexicans, Indians, and a few stragglers from the outside world, though at one time several hundred men were employed in digging the gold.

These mines are located on broad table lands on the top of the mountain system of the peninsula, with numerous depressions and broad, shallow valleys, where the miners were usually most successful. The mines consisted mainly of square holes dug from two to five or six feet in depth, from which the lower layer of clay-like soil was taken, and either carried a few miles to water and washed out, or the water would be brought to the mine in casks and used over and over until a new supply became necessary. This slow and wasteful way of working the mines yielded the workmen from two dollars a day upwards, the average yield perhaps exceeding four dollars, but at present, or when I last visited this district, less than a dozen men were engaged in the work. I have myself washed gold out of the soil in these mines, and it would be difficult to find ground that would not yield at least a color in the whole of this vast district.

Another equally extensive district is that east of the old Hanson ranch, similar in general character, in fact, an extension of it, but at a higher elevation being nearly six thousand feet above the

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sea. Quite a camp was once established at this point, but owing to the propensity of the miners for stealing cattle from Mr. Hanson, the camp was finally destroyed and prospectors given little chance to learn the true value of the district.

Other placers similar in character to the above are to be found throughout this gold belt, back of San Rafael and San Quintin, in various directions, but none of them have been well prospected or worked by any experienced miners. The extent and richness of these large tracts of land cannot therefore be foretold. Doubtless, many fortunes await those lucky few who may first prospect the gulches leading *from* the placers, or who may select carefully their claims. If the reports now in circulation prove reliable, this discovery exceeds any made in the days of '49.

The gold belt may be said to be bounded on the north by San Diego County, though gold is found in nearly all parts of San Diego County in greater or less quantity; on the east the Colorado desert is a sufficient barrier for the present, until transportation can be provided, while no southern limit is known, though we may for convenience limit it to the peninsular range, ending in the San Pedro mountain, about which our interests in the gold developments must center. We may expect all sides of this great mountain and its dependencies to be thoroughly prospected in the near future, and no one need be surprised at some rich developments.

The discovery of these rich placers, though they may be limited possibly in extent, will result in the rapid development of the mineral resources of this important territory. Even if the present excitement is doomed to be short lived, we shall not see the day when the placers of the peninsula will become wholly exhausted.

But it is not to the placers that we shall look for the greatest returns, but to the ultimate discovery and development of the many quartz veins known to exist below the line.

Promising quartz mines are now being developed at Los Cruzes, at San Rafael, and near the Santa Rosalie Bay, two hundred miles south of the first named, while numerous valuable quartz veins are being *denounced* (located) around the Santa Clara placer mines, around which the present excitement centers. The Santa Clara placers are 150 miles from San Diego, and already boast a mining camp variously estimated at from 300 to 2,000 population, where no one has been previously living, while all the surrounding towns are reported as virtually deserted.

If the reports continue favorable, the editor will debate the question—which is the mightier, the pick or the pen? and give our readers the latest news from the mines.

C. R. Orcutt.

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HINTS ABOUT KILLING LEPIDOPTERA.

It is important when collecting insects, to preserve their form, color, and scale-covering. With Lepidoptera the importance of such care is evident. Many rare and desirable specimens are found to be, when captured, more or less diverted of their hypodermal coloration; such individuals should always be preserved until replaced by better.

Avoid hastily killing by pinching, as such a procedure destroys the symmetry and relative position of the parts so treated. Do not unthinkingly and carelessly grasp the wings; but, on the contrary, handle gently with forceps or fingers, being careful to grasp the sides of the thorax from the under surface of the insect without applying too great compression; the appendages may often be utilized for this same purpose. The main object being to preserve the natural appearance of the specimens for study, and to give a neatness and perfectness to the collection, which always reflects great credit upon the collector.

The use of chloroform, ether and cyanide of potassium as agents for destroying life is not entirely satisfactory, as a rigidity is imparted to the muscular structures, rendering a quick and easy manipulation difficult, owing to the persistency of the positions assumed at death.

Exposure to the vapor of aqua ammoniae produces complete flexibility, with the objection that it requires too long a time to suffocate the larger species and the liability to bleach and destroy the animal colors. An agent which will quickly kill and impart relaxation to the muscles is a desideratum of great importance to the collector of these fragile and delicately tinted insects. Such a result can be obtained by the combined action of aqua ammoniae and cyanide of potassium.

Every collector of Lepidoptera should have two or three wide mouthed bottles or jars of different sizes—the smaller to receive the micro-lepidoptera; the larger ample enough to contain the larger species of Sphingidæ and Bombycidæ. Each jar or bottle should be prepared in the following manner: First place a layer of cotton in the bottom thoroughly saturated with the ammonia, over this is to be placed a thicker layer of dry cotton, upon which the potassium should be placed and the whole surmounted by another mass of cotton, covered by a piece of thick paper, previously punctured and neatly fitted into the bottle in such a way as to hold the cotton in place.

The jars should at no time be long inverted. It is best to prepare them a couple of weeks before using, then add a fresh supply of ammonia, and a good result can be expected.

Such is my method for killing Lepidoptera, and I have had excellent success, as shown by the rapidity with which I can mount my specimens, with the removal of scales reduced to a minimum. *F. E. Blaisdell.*

CORONADO, Jan. 6th, 1889.

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PRELIMINARY DESCRIPTIONS OF NEW SPECIES AND GENERA OF CHARACINIDAE.

CURIMATINAE.

South American Characinidae with greatly convoluted intestinal canal, short dorsal fin, and imperfect dentition. Limnophagons.

Division I. Teeth nour.

Psectrogaster gen. nov.--Post ventral region trenchant, the scales of each side with a narrow margin bent over the ventral ridge and terminating medially in a spiniform process. Preventral region rounded, predorsal region scaled. Scales 50-60. Typr.

Psectrogaster rhomboides sf. nov.—? Curimatus cyprinoides, Steind. Flussfische Sudam. II 34, 1881 (Rio Putz). Types: Nos. 20,303, 20,304 and 20,306. Over fifty specimens collected by O. St. John in the Rio Putz. No. 20,310, one specimen from San Goncallo.

It is our opinion that Dr. Strindachner erroneously identified specimens with a serrate belly with the Salmo cyprinoids Linnaeus. But whether *cyprinoides* has a serrate belly or not, the specimens from the Rio Putz are quite different from those from the Amazon, to which the name cyprinoids would have to be restricted. Air bladder tapering backward, its tip extending to origin of anal fin. Origin of dorsal about equidistant between tip of snout and base of upper caudal fulcra. Depth 2¼-2 3-5. Lat l. 53-58.

Psectrogaster amozonica sp. nov.—Types: many specimens from Teffe, Içа, Tabatinga; Obidos, Fonteboa, Lago Alexo, Jutahy, Tonantins. Sautarem, Hyavary, Curnpira. Air bladder attennate backward, its tip reaching the end of the anal fin. Origin of dorsal about equidistant from tip of snout, and from tip to adipose fin. Depth about 2¼. Lat. l. 49-56.

Curimatopsis microlepis sf. nov.—Type: No. 20,344. One specimen collected by M. Navez at Jatuarana. Lateral line developed on about twelf scales. Anterior dorsal rays prolonged, reaching adipose fin.

Light brown with iridescent metalic reflections. Margins of the jaws and inner surface of the lower jaw dark brown. Head 3⅓; depth 2¾-3¼. D. 11-12; A. 11. Lat. l. 60.

The only other known species of this genus has but 30 scales in the lateral line.

CURIMATUS.

1. Species with the caudal scaled to its tip. *Curimatus serpae* sp. nov. Types. No. 20,320 four specimens from Serpa.

Predorsal region sharply keeled to the occipital crest. Head

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3¼–3 2-5; depth 3; scales 6, 39–41–5; color of alburnus and meyeri. *Curimatus lepidurus* sp. nov.

Type: No. 20,291 and 20,292. Five specimens collected by C. F. Hartt in the San Francisco below its fall.

Predorsal region with a distinct median and indistinct lateral keels. Sides and lower parts yellowish, back bluish, each scale of the sides with a narrow median line of golden. Head 3½; depth 2½–2¾; scales 9–43 to 45–7.

C. H. and R. S. Eigenmann.

A NEW FLORIDA BULIMULUS.

BULIMULUS HEMPHILLI, sp. nov., Fig. 449 of Binney's Manual of American Land Shells, Bulletin U. S. National Museum, No. 28.

Shell imperforate, very thin, transparent, amber colored and marked by coarse lines of growth; body whorl with six revolving and slightly interrupted brownish-red bands; the lower two being close together and upon the rounded base, spire obtuse, whorls five, slightly convex, the body whorl constituting two-thirds of the entire length of the shell. Suture slight, base uniformally and gracefully rounded. Aperture direct and oval, peristome thin. "Jaw and lingual dentition that of nitelinus" (B. Serperastris Says)." Dr. Binney. Length, 19 inches, diameter, 8 inches. Hab. both coasts of South Florida.

Remarks: Mr. Henry Hemphill of San Diego, Cal., first found a few dead and badly preserved specimens of this shell in 1384 at Marco, West Coast of Florida. From these, Dr. Binney thought them identical with B. Floridanus, Pf. (See Manual of American Land Shells, 1885.) Numerous specimens collected during the past summer by the author and Mr. G. W. Webster and son, prove beyond a doubt that this is not identical with the shell figured and described on page 407 of Dr. Binney's Manual. The B. Hemphilli is more ventricose, not angular at base, imperforate, differs in color, and in fact, there is a general difference.

Berlin H. Wright.

LAKE HELEN, FLA.

DESCRIPTION OF NEW NEMATOGNATHOID FISHES FROM BRAZIL.

MICROLEPIDOGASTER, G. NOV.

Type: *Microlepidogaster perforated*, sp. nov.

This genus is closely related to *Octocinclus*, differing from that genus in the armature of the belly and in the position of the dorsal fin.

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Those genera of Plecostominæ, destitute of an "adispose" dorsal fin, may be distinguished by the following key:

(*a.*) Temporal plate perforate. (Species of small size.)

(*b.*) Ventral surface covered by three series of large plates; dorsal fin inserted over the origin of the ventrals.

Oclocinclus.

(*bb.*) Ventral surface covered by minute granular plates; dorsal fin inserted far posterior to the ventrals, its origin equidistant from tip of snout and base of caudal.

Microlepidogaster.

(*aa.*) Temporal plate imperforate.

(*c.*) Ventral surface covered by about three series of large plates. (Species of small size.) *Hisonotus.* (*

(*cc.*) Ventral surface naked or covered by minute granular plates. (Usually species of large size.)

(*d.*) Margin of the snout granular. *Rhinelepis.*

(*dd.*) Margin of the snout with spines; lateral plates isolate. *Acanthicus.*

Microlepidogaster perforatus sp. nov.

Type: No. 8,182; one specimen. .032 m. to base of caudal. Rio Carandahy, Brazil.

Broad and depressed anteriorly, the depth less than the width. Head broad, depressed, its depth little more than two in its length to the end of temporal plate; its width 1½ in its length. Snout narrow, pointed; loreal region concave. Eye 4 in snout, 8½ in head; interorbital concave, equal to the post-orbital portion of the head.

All of the plates hispid, most so on the tail, not keeled. Belly entirely covered with small granular plates to between the ventrals. Lat. l. 27.

Rhinelepis lophophanes sp. nov.

Type: No. 8,164; one specimen .018 m. to base of caudal. Santa Cruz, Brazil. Collected by Dom Pedro II.

Greatest depth equal to the greatest width. Occipital with three strong spiniferous ridges, a short median one and two longer lateral ones; similar crests extending from posterior margin of orbit to edge of temporal plate. Nasal pits margined by spiniferous ridges. Lower surface of head naked, margined by a series of recurved spines. Coracoid and scapula granular; belly with a small granular plate between posterior margins of ventrals; a larger plate behind the pectoral. Lateral and dorsal plates keeled. D. I, 7; A. 6; Lat. l. 22.

This species differs widely from the other species of *Rhinelepis*, as may be seen from the following comparison:

a. Ventral surface mostly naked.

*) Gen. Nov. in press.

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b. Lateral plates not keeled; head not crested.
Parahybae.

bb. Lateral plates all keeled; occipital with three crests.
Lophophanes.

(*aa.*) Ventral surface entirely granular.

(*c.*) Eye 6-6⅘ in, the head to end of occipital plate; head arched above; opercle and interopercle with spiny margins; lateral plates keeled; surface of all the plates entirely covered with spiniferous ridges. *Agassizii.*

(*cc.*) Eye small, 10 or more in the head; head flattish above; lateral plates not keeled. *Aspera.*

The specimens belong to the Museum of Comparative Zoology at Cambridge, Mass., and the numbers given refer to the catalogue of the Museum.

C. H. & R. S. Eigenmann.

NOTES ON THE FLORA OF CUSTER COUNTY, COLORADO.—III.

TOWNSENDIA SERICEA HOOK.—Common on the prarie, one of the earliest flowers of the year. It is also recorded from Fremont Co., and Miss M. Sidford has collected it at Colorado Springs, El Paso Co.

SOLIDAGO MISSOURIENSIS NUTT.—Abundant at about 8,400 feet. The larvœ of the beetle (Trirhabda flavolineatus) feed upon it. These larvœ, which have not previously been described, are about twelve millimetres long, moderately stout, with all the segments approximately of equal size. The head is very dark brown and shiny. The body is a dark metallic greenish blue, pale yellowish green beneath, sparsely hairy with short hairs, and having a row of raised tubercles on each side, one on each segment. The legs are black, pale at their bases.

ASTER LŒVIS, L., VAR SIMPLEX.—This answers to the description of lœvis, except that the flower head has only 17 to 18 rays. It is locally abundant at about 8,400 feet. Æcidium compositarum, mart. is found upon its leaves.

ERIGERON RADICATUS, Hook.—Common on the prairie, and flowers early in the year.

ANTENNARIA DISICA, Gœrtn—Very abundant in open ground, and very variable. The ordinary form has white flowers, but a var. rosea is not unfrequent, in which the flower heads appear of a beautiful pink color.

GYMNOLOMIA MULTIFLORA, (Nutt.)—Abundant; the homopterous insect, Publilia modesta uhler, occurred upon it in great abundance just in front of my house. I also found G. multiflora

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in Delta and Mesa counties. Bombus rufocinctus, cress, visits its flowers in Custer Co.

ACHILLEA MILLEFOLIUM, L.—Exceedingly abundant in Custer County, and known also from the following counties: Pueblo, Routt, Fremont, Lake, Eagle, Garfield, Mesa, Summit, Delta, Gunnison, El Paso and Saguache. I have found Cantharis compressicornis on its flower heads in Custer Co., also Trichodes ornatus.

SENECIO FEUDLERI, Gray.—Frequent in open ground.

TROXIMON AURANTIACUM, Hook.—Not rare at about 8,400 feet, but I fonnd it more commonly in Delta Co.

CAMPANULA ROTUNDIFOLIA, L.—abundant, and also found in Mesa, Delta and Summit counties. There is a variety which has white flowers, and it is a most singular fact, first noticed by Mrs. M. E. Cusack, that these turn blue in drying for the herbarium. Campanula uniflora, L., and C. planiflora, Eng., also occur in Custer Co.

ARCTOSTAPHYLOS UVA-URSI, Spreng.—Covering large tracts of ground in the woods, begins to flower in the latter part of April. A var. alba, with the flowers white, and smaller than the type, occurs rarely. The ordinary form was also found in Pueblo and Summit counties, and Miss M. Sidford reports it from Colorado Springs, El Paso Co.

PYROLA SECUNDA, L.—Not unfrequent in the mountains.

DODECATHEON MEADIA VAR. ALPINUM, Gray.—In the mountains, to 11,000 ft., abundant.

ANDROSACE SEPTENTRIONALIS, L., and A. occidentalis, Pursh.—Abundant about the edge of the timber and in clearings at 8,200 to 8,500 ft.

PRIMULA PARRYI, Gray.—Very frequent high up on the range. The smaller species, P. angustifolia, Torr., was found at over 11,000 ft., but so far, only on the other side—in Sagnache County.

PRIMULA FARINOSA, L.—Years ago, I received an example of this species, collected by Mr. W. West at Malham, Yorkshire, Eng., and always regarded it as one of my most interesting specimens; but I had never found it growing until June 12th, 1888, when I quite unexpectedly came across it in flower by the roadside near Ula. This seems to be the most southern locality recorded for it in Colorado.

GENTIANA HUMILIS, Stev.—In damp meadows; begins to flower about the middle of April. The flowers vary in colour from nearly white (albescens) to blue (cœrulea).

GENTIANA SERRATA, Gunner.—Abundant and very conspicuous. Found also in Mesa and Summit counties.

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MERTENSIA OBLONGIFOLIA, Don., and M. alpina, Don.—Very frequent at about 8,200 feet and upwards.

SOLANUM TRIFLORUM, Nutt.—A common garden weed; also met with in Pueblo Co.

SOLANUM ROSTRATUM, Dunal. The only locality in Custer Co. is in the eastern part, near to the boundary of Pueblo Co. It probably does not occur even as high as 7,000 ft.

PENTSTEMON ACUMINATUS, Dougl.—Very common at about 8,300 ft., in open ground.

APHYLLON FASCICULATUM, Gray.—On the prairie, at about 8,000 ft. *T. D. A. Cockerell.*

WEST CLIFF, CUSTER CO., COLO.

BRIEF ARTICLES.

OUR ABALONE FISHERIES.—It is estimated that some three hundred tons of the shells of the abalone were shipped from San Diego during the past year. Fifty tons were handled by Mr. A. Wentscher in January of the present year, but this does not indicate an increase in the trade. The greater portion of these shells are collected on the coast of Lower California. The Chinese are the principal gatherers, notwithstanding they are prohibited by Mexican laws. The shells are sold at $20 to $35 per ton, according to the quality, and the dried meat of this mollusk, which is in great demand in China, brings $110 per ton. The species mainly collected in this vicinity (San Diego) are Haliotis splendens, Rve., and H. cracherodii, Leach, with occasionally a few specimens of H. corrugata, Gray. The red abalone (H. rufescens, Swains) seems to be most abundantly obtained at Monterey. I have never seen it at San Diego, though I have found it on the Lower Californian coast at the Santo Tomas landing. *C. R. Orcutt.*

COLORADO BEETLES.—I recently sent Dr. John Hamilton, among other Coleoptera, a couple of species collected by Plateau Creek, near Eagalite, Mesa Co., Colo., on Sept. 20, 1887. One of them proves to be Trechus micans, Lec. (= Chalybeus Mann.) while the other is identified somewhat doubtfully as the ♀ of Eleodes quadricollis, Esch. Dr. Hamilton writes: 'The Eleodes quadricollis ♀ ? agrees exactly with the ♀ of that species from near San Diego, Calif., in my collection, but as the females of same species are almost inseparable without the ♀ belonging, and E. quadricollis having never been recorded from Colorado, this may be an abnormal ♀ of E. extricata.' Later, he writes that E. quadricollis has been recorded in the report of Wheeler's Survey from South Park and Pagosa (Park and Archuleta counties), so mine will be only a new county record.

T. D. A. Cockerell.

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PROCEEDINGS OF SCIENTIFIC SOCIETIES.

THE SAN DIEGO SOCIETY OF NATURAL HISTORY.—March 1, 1889. Geo. William Barnes, M. D., on Cremation.

BIBLIOGRAPHY.

I. B. ELLIS and B. M. EVERHART. New species of Fungi.—*Journal of Mycology.* October 1888, pp. 97-107. Several western species are described as new, viz.—Parodiella fruticola, Sphœrella applanata, Peziza clavigera and Phoma mamillariœ from Montana; Sphœrella spartinœ from Nebraska; and Dermatea pruinosa from Colorado. The precise locality of D. pruinosa is not given, but the type specimen was on the bark of Populus tremuloides, in Western Custer County, at about 8,400 feet.
T. D. A. C.

JAMES CASSIDY. Report of experiments with Potatoes and Tobacco. Bull 4. Colorado Experiment Station. On p. 13, Solanum tuberosum var. boreale is added to the flora of Colorado. Attempts were made to cultivate it. *T. D. A. C.*

C. H. AND R. S. EIGENMANN. New species of Cyprinodon (C. nevadensis), from Inyo Co., Cal., Bull. Cal. Acad. Sci., 2d Ser., Vol. I, 270. *C. R. O.*

THE NATURALIST. No. 161, Dec., 1888. The December number of this admirable periodical, devoted to the Natural History of the North of England, contains some articles of interest to the naturalist on this side of the water. On p. 354, Mr. I. Cordeaux records the occurrence of an example of the American Pectoral Sandpiper (Tringa maculata) on the Yorkshire Coast—this being the fourth example which had been taken in Yorkshire.

There is also a valuable Bibliography of Cryptogamic Botany for the North of England, 1886 and 1887. It is remarkable how many species we have in Western America which are common also to England, and this resemblance is especially marked in the mountain regions. Going somewhat casually through this bibliography, we note the following species, for instance, common to the North of England and Colorado: Thudium blandovii, Bryum muhlenbeckii, Grimmia trichophylla, Mnium serratum, Morchella esculenta, Æcidium compositarum, Dicranum fuscescens, Cladophora glomerata, Draparnaldia plumosa, Solorina saccata, Hedwigia ciliata, Hypnum eugyrium, Iungermannia bantriensis, I. cordifolia, Funaria hygrometrica, Webera nutans, Mnium punctatum, Amblystegium serpens, and A. radicale.
T. D. A. C.

H. I. ELWES exhibited a number of butterflies, collected in California and Yellowstone Park, at a meeting of the Entomological Society of London, Eng.; among them was the species

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known as Erebia haydenii, Edw., which, however, Mr. Elwes considered would prove to be a Cœnonympha. "Entomologists' Monthly Magazine," Nov., 1888, p. 144. *T. D. A. C.*

C. H. MERRIAM describes a new fox, Vulpes macrotis n. sp., from S. California. Proc. Biol. Soc. Washington, 1888. *T. D. A. C.*

I. W. DOUGLAS describes a new species of Coccus, which he calls C. agavium n. sp., in Ent. Mo. Mag., Dec., 1888, p. 150. It was from an Agave which had been brought to England from one of the Southern States. Search should be made for the "white cottony matter" on the under side of the leaves of Agaves in California, Arizona, etc., in the hope of meeting with this species. *T. D. A. C.*

I. P. NORRIS. A series of eggs of Sitta pygmœa. Orn. and Ool., Nov., 1888, p. 173. Nine sets described, one from Estes Park, Colo., and the rest from Fort Klamath, Oregon. *T. D. A. C.*

CHAS. F. MORRISON. A list of the Birds of Colorado. *Ornithologist and Oologist*, Oct., 1888, p. 145; Nov., p. 165. This valuable list, of which the first two parts have appeared, was compiled for the Colorado Ornithological Association (now the Colorado Biological Association). It gives full and interesting details respecting every species of bird at present known from Colorado. The only omissions we note at present are of the entirely light cream-colored aberration (might be called albescens) of Anas boschas recorded by W. G. Smith in 1887, and two hybrid ducks recorded by the same author, and referred to Querquedula Cyanoptera x discors, and Anas strepera x Americana respectively. *T. D A. C.*

I. P. NORRIS. Nesting of Otocoris alpestris strigata *Orn. and Ool.*, Nov., 1888, p. 162. On the nesting of this bird in Oregon; description of the eggs. *T. D. A. C.*

H. R. TAYLOR. Nesting of the Golden Eagle. *Orn. and Ool.*, Nov., 1888, p. 172. The nesting of Aquila Chrysaetus canadensis in Santa Clara County, California. *T. D. A. C.*

CALIFORNIA STATE BOARD OF FORESTRY. The second biennial report (1887–88) contains an essay on the "Pines of the Pacific Coast," particularly those of California, by the State botanist, J. G. Lemmon, accompanied by numerous artotype illustrations of the cones, seeds, leaves and trees of the various species treated. Of special interest is the recording on pages 106 and 111–112 of the discovery by T. S. Brandegee, on the east (the shore) end of Santa Rosa Island of about 100 trees of Pinus Torreyana, Parry—a species hitherto only known from a very limited area at Delmar, San Diego County. Mr. Brandegee does good work wherever he goes, and this discovery of his during the past season (1888) is not the least important of his con-

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tributions to botanical science. The form of pinus Jeffreyi found on the mountains in northern Lower California at an elevation of about 4,000 feet received from Mr. Lemmon the varietal name peninsularis. *C. R. O.*

C. C. PARRY. Ceanothus, L., a synoptical list comprising 33 species, with notes and descriptions. Proc. Dav. Acad. Sciences, V., 162–174. C. intricatus, from summit of Mt. Tamalpias, Calif. (Curran); C. Andersoni, Santa Cruz mountains (C. L. Anderson, 1887); C. divergens, from Napa Valley, are the new species described. The white-flowered species from the mesas of San Diego and Lower California, are generally distributed as C. Cuneatus, Nutt., is referred to C. verruccosus, Nutt., instead. What has generally been referred to C. sorediatus, Hook and Am., from Southern California (and so disributed) Dr. Parry speaks of as "an aborescent form of C. hirsutus, Nutt., or possibly an undescribed species." Dr. Parry also reviews certain species of Chorizanthe in an accompanying paper (pages 174–176), describing two new California species. *C. R. O.*

W. G. FARLOW. On some new or imperfectly known algae of the United States.—I Bulletin Torr. Bot. Club, xvi, 1–12. Several new species from the California coast are described, with notes on others. *C. R. O.*

TROPICAL AFRICA. By Henry Drummond, L. L. D., F. R. S. E., F. G. S. New York, 24 East 4th street: The Humboldt Publishing Company. Price. fifteen cents. A work of almost thrilling interest, giving an account of the authors experiences and observations in a trip through some of the most mysterious portions of the continent which is now attracting so largely the attention of the public. It is very racily written, and and the author is both graphic in his descriptive passages, and witty in his observations The very interior life of the country, where civilization has just begun to wrestle with barbarism, is laid open. Much of the book is devoted to a discussion of the slave trade, which has depopulated whole regions of the continent; and Professor Drummond is very anxious to see a combination of European powers for the pupose of bringing it to an end.

EDITORIAL.

With this issue, Messrs. Samuel Carson & Company, 208 Post street, San Francisco, California, assume the entire business management of the WEST AMERICAN SCIENTIST and become its publishers, the editorial management remaining unchanged. Comment is unnecessary.

San Diego is entering upon a new era in the history of her remarkable development, as a glance at a few great enterprises will abundantly demonstrate. The completion of the great

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flume, at a cost of nearly a million dollars, by which the pure, mountain water is brought to our doors, is an event worthy of record, and one which was fittingly celebrated on Washington's birthday.—The building from San Diego of the Cuyamaca Railroad through the interior of our county, traversing the fertile valleys of El Cajon, Santa Maria, Ballena and others, and rendering our great mineral belts easily accessible, is another enterprise of which we may well feel proud, and by which hundreds of miles of travel can be saved in our overland communications.—The new management of the International Company of Mexico is actively pushing forward the preliminary work of the peninsula railroad in a way that inspires confidence, notwithstanding the frequent disturbing rumors that gain circulation.—The discovery of remarkably rich placer gold mines about 50 miles from Todos Santos Bay, Lower California, in the latter part of February, has created as great an excitement as we have known since the collapse of wild real estate speculations. The actual development of valuable quartz mines below the line is still more encouraging.—A new land and water company has been formed to develop the eastern half of San Diego County by providing irrigation for the 5,000,000 acres embraced in the plains known as the Colorado Desert. The cause of humanity is not being neglected among these great enterprises. The Hospital of the Good Samaritan will soon be open to all creeds, all nationalities, all physicians, and all ministers," in the support of which San Diego will bring credit upon herself.—Nearly a million of dollars has been provided by the will of the late James M. Pierce and by Bryant Howard and E. W. Morse for the establishment of a series of benevolent and educational institutions in our city, which will be open to all classes and will provide for a boy's and girl's home, kindergartens, a school of technology, and other equally worthy departments.—The San Diego College, at Pacific Beach, the College of Fine Arts of the University of Southern California, the Southwest Institute, and other schools, are all active in providing for the present and future educational needs of the country. In view of all the above, in connection with the natural and commercial advantages of San Diego one may be pardoned for predicting concerning the future, but we will resist the temptation.—P. E. Truman, of Dakota, has spent his winter vacation from his law practice in collecting the lepidoptera of Southern California. He has promised to contribute to these pages the results of his labors.—The California Ornithological Association was to be organized at the California Academy of Sciences, San Francisco, on February 9th. We hope to report some good work for them.—We are advised that a scientific association has been formed in Washington Territory, but we have been able to gather no details.—Prof. D. S. Jordan, of Indiana, writes concerning the fish discovered on the Colorado Desert, and described in these pages

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(V. 2-4): 'They are certainly Cyprinodon macularins, B. and G.; C. Californiensis, a later name, may be based on young males. The description is too poor to be certain.'—The editor collected in January, at Todos Santos Bay, Lower California, two species of coral, one, a small branching red species, and the other apparently identical (though the specimens were much smaller) with a species collected by J. J. Rivers, at Monterey, in 1884 (Ballanophyllia elegans, Verrill).—We have to acknowledge the receipt of valuable publications from many sources, and our thanks are especially due for such favors to Drs. C. C. Parry, R. W. Shufeldt, D. S. Jordan and C. A. Greene, Messrs. Coulter & Rose, William Danbar, T. D. A. Cockerell, Sereno Watson, Geo. F. Kunz, J. G. Lemmon, W G. Farlow, Wm. Trelease, Alexis A. Julien, G. W. Lichtenthaler, F. A. Sampson, S. W. Davis and others.—An interesting paper on cremation is presented in this issue from the pen of Geo. William Barnes, M. D., who for so many years has been president of the San Diego Society of Natural History. The subject is worthy of careful consideration.—The Colorado Biological Association is doing good work for that State under its able secretary and our valued correspondent, Theo. D. A. Cockerell, who assists us with our Bibliography, which will hereafter be an important feature of this magazine.—It is not improbable that the WEST AMERICAN SCIENTIST will be adopted by the Association as its official organ. We aim to make the magazine a true representative of the scientific activity of societies and individuals in the West, and shall cordially welcome co-operation.—In securing the services of experienced publishers, with every facility for its regular and creditable appearance, the SCIENTIST enters upon a new era of prosperity. Our magazine was the first to be issued from the City of San Diego, but it is distinctively West American—not local—in character, and it is fitting that we should be equally represented in what are destined to be the two greatest cities of the Pacific Coast.

NOTES AND NEWS.

Dr. R. W. Shufeldt, who has been stationed for a number of years at Ft. Wingate, N. M., where he has done much valuable work for science, has returned to his home in Washington, D. C.

W. G. Wright is making the acquaintance of the butterflies of Mexico, and will no doubt return with many new and beautiful forms from the islands and coast of the Gulf of California, beside adding otherwise to the fauna and flora of the regions visited.

Three new species of fish have been added to our San Diego fauna the present winter; and two others, one a rock cod (Sebastichthys chlorostictus), previously known from Monterey

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northward, and the other a blue cod (Ophioden elongatus), known from Alaska to Santa Barbara, have been taken in our waters.

The U. S. Steamer Albatross will spend the larger part of March and April in the Gulf of California, investigating the temperature and depth of its waters to determine if the conditions are favorable to the shad, which have been planted at the mouth of the Colorado river. The scientific staff will study the shore fauna of Lower California on their return.

C. H. and R. S. Eigenmann have devoted the winter to the study of the embryology of our fish, especially of the herring, the smelt, the rock cods (the young of which had never been described), and of the Embriaticoids of San Diego, the eggs of which had never been seen before.

E. W. Roper, of the Bay State, has collected nearly 200 species of mollusks at San Diego during his six weeks' visit, and will visit other localities northward before his return East. He visited Todos Santos Bay, Lower California, in January, in company with the editor, where we found a rich harvest of marine forms to gather.

Pupa Californica, Rowell, has been added to our fauna by the editor, who finds it abundant under the dead decaying plants of the Beach Strawberry (Mesembrianthemum aequilaterale, Haw.), both at San Diego and at Ensenada, Lower California.

California is to have another observatory to be located near Los Angeles in connection with the University of Southern California. They will seek to surpass even our famous Lick Observatory in power of lens.

F. Stevens of Ballena visited us recently. He will 'ranch it' by proxy, and collect birds the present season.

Dr. Edward Palmer has been exploring the vicinity of San Quintin Bay, Lower California, and has added somewhat to our flora.

C. H. Townsend, C. H. Gilbert and Mr. Alexander of the scientific staff of the Albatross, and C. H. Eigenmann, visited Ensenada, Lower California, in February, returning overland. The common fresh water terrapin (actinemys marmorata) was the only thing reported to us as being collected.

Robert Douglas, who with his son, Thos. H. Douglas, is in charge of the grounds of the arboretum, to be established in connection with the Leland Stanford, Jr., University, has favored us with his society recently. Nine hundred acres, or more if required, are to be devoted to the arboretum at Palo Alto, California, making this the largest similar establishment in the world. Every known tree or shrub that can be made to thrive on the Pacific Coast is intended to be included, and especially all of our native species.

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Each year the *Youth's Companion* presents its readers with instructive articles on science and natural history. The prospectus for 1889 announces the following for the current volume: The Wonders of a Crystal, by Prof. Tyndall; A Chapter on Elephants, by Prof. Huxley, the eminent biologist; Insect Life, by Prof. C. V. Riley, Chief of the U. S. Entomological Commission; Talks About Birds, by Miss E. F. Morrison, in which the art of keeping and raising pet birds will be explained in a clear and attractive manner; Bashful Drummers, by Bradford Torrey, giving an account of some interesting birds; Papers on Electricity, by several eminent and practical writers; and articles on interesting astronomical events, by Miss Emma M. Converse, and other writers, including the directors of some of the great observatories.

The especially interesting features of the March *Century* are the essays on Rules of the House of Representatives, by Hon. Thos. B. Reed of Maine; a full length portrait of the United States, by Dr. Edward Eggleston—a review of James Bryce's famous work on the 'American Commonwealth;' and Lieut. W. H. Beehler, on 'The Use of Oil to Still the Waves.'

Garden and Forest is doing good work for the cause of American forests, and for the interests of North American horticulture, not the least of which is the interest it is striving to arouse in the developing of our arid regions of the West.

ERRATA.

We have a larger list of errors, both of omission and of commission, to chronicle in this issue than is pleasant for an editor. Those committed in our last number were so grievous that we considered it advisable not to distribute it to our subscribers, nor to attempt another issue until sure of its appearing in a manner that would not bring discredit to either the editor or his trusting contributors. The description of 'A New Florida Bullmulus,' should have appeared in the suppressed number, but our printer mixed the Mss. with others belonging to the *Old Curiosity Shop*, a magazine edited by E. M. Haighs, of Riverside, Cal., so that the description appeared in the latter instead. Further comment is useless, beyond adding that from some cause yet unexplained to us, proofs were seen by neither our proof reader or by the editor until too late.

The more important corrections to be made in the fifth volume, are:

On page 10, 18th line from bottom read, maloaeflora, instead of maluceflora.
On page 10, 10th line fron the bottom, read Torr, instead of Tow.
On page 11, 11th line from the bottom, read Sedum, instead of Sedun.
On page 11, 9th line from the bottom, read Smitheus, instead of Smithens.
On page 12, 22d line from the bottom, omit oleander.
On page 12, 21st line from the bottom, read Canadensis, instead of canaelensis.
On page 12, 19th line from the bottom, read Œnothera, instead of O. Enothera.
On page 12, 13th line from the bottom, read Heliotropium, instead of Heliotiopicum.
On page 12, 8th line from the bottom, read Eremocarpus, instead of Eremoceu[illegible]us.
On page 14, 13th line from the bottom, read Tineina, instead of Fineina.
On page 15, 4th line from top, read Confused, instead of Confessed.
On page 17, 3d line from top, read I. Var. Maculatus, instead of I. Var. Imaculatus.
On page 17, 1st line from top, add after Watson, *In this vicinity.*
On page 18, 26th line from bottom, read Rubida, instead of Nebida.
On page 18, 9th line from bottom, read Locustidae, instead of Lecustidoe.
On page 19, 2d line from bottom, read Oncocenemis, instead of Oncoenemis.
On page 20, 5th line from top, read larva, instead of larval.
On page 20, 6th line from top, read fly, Trypeta, instead of flytrypeta.

LUPINUS PARVIFLORUS VAR. SERICEA. On page 11, a new variety of lupin is described and named *sericea*, but from some accident it has got placed under L. argenteus, whereas it really belongs to L. parviflorus, Nutt., having all the essential characteristics of that species. Both L. argenteus and parviflorus seem very variable, especially the former.

December 22, 1888. *T. D. A. Cockerell.*

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HUMMING BIRDS.

BY S. ESTLE MILLER.

In all the field of oology, there is no group of birds so interesting to the naturalist as the humming bird. Its size, its gorgeous colors and the abundance of different species, have given this small bird a pre-eminent position among the feathered tribe. The continents and islands of America are its home, and no other country can boast of a single species. It may be found all the way from the Arctic regions, of the chilly north, to Patagonia in the south. They are more numerous in the West Indies and Central America than in any other part of the continent, and it is here that the most beautiful are to be found. The tiny crest of one of these shines like a sparkling crown of colored light, while the colors adorning the breast are equally brilliant.

The species of the humming bird family now number more than three hundred, and through the energy of naturalists, this number is being increased every year. These birds have taken their name from the soft, humming noise made by the rapid motion of their wings. It is claimed by some that this sound differs in different species, and often to such an extent that an observant ear can detect the species by this noise produced in its flight. One of the very common species here in Ohio is the ruby throat, which takes its name from the feathers that encircle its throat, and shine with a ruby lustre.

The humming bird arrives here in Ohio about the 5th of May, each year, and usually comes in pairs. They begin their nest-building about the first week in June. Not long ago, when out walking, we found the nest of one of the smallest of these birds. It was about half the size of a hen's egg, and was swung to a twig about the thickness of a knitting-needle. It was made of cotton fibers and the down of certain plants, and was covered with small bits of leaves and soft bark. The eggs, two in number, were white, elliptical in shape, and of nearly the same size at each end.

The naturalist Andubon discovered a very curious habit belonging to these birds, and one that he concluded was resorted to in order to conceal the whereabouts of their nest. It was this:

While watching the nest of one he saw the female bird suddenly leave its station on a neighboring limb and shoot perpendicularly into the air until it was lost from sight. After a few moments of patient waiting, he had the pleasure of seeing it descend and alight directly upon the spot where she had constructed her nest.

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THE GIANT CACTUS.

—o—

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THE WEST AMERICAN SCIENTIST.

VOL. VI. JULY, 1889. No. 45

CONTRIBUTION FROM THE SAN DIEGO BIOLOGICAL LABORATORY—II.

ON THE GENESIS OF THE COLOR-CELLS OF FISHES.

So far as I am aware the origin of the color-cells or chromatophores of fishes has never been discussed. A. Agassiz (on the Young Stages of Bony Fishes, ii) has described the color changes of young flounders, and Agassiz and Whitman have promised a discussion of the genesis of the chromatophores in the second part of their paper on "The Pelagic Stages of Osseous Fishes" which has not yet appeared.

My observations have been based on the embryos of many species, but for the present purpose only those of Sciaena saturna, Hypsopsetta guttulata and Pleuronichthys coenosus (?) are available. Naturally the genus Stolephorus and many other Isospondylous fishes in which no color is observed forty-eight hours after hatching, are not available for a study of the origin of the color-cells; nor can any use be made of such genera as Oligocottus, Isesthes, Atherinops and Atherinopsis, in which the color appears in the egg after several days, and then appears at sometimes widely separate portions of the embryo.

The eggs of Hypsopsetta and Sciaena may always be collected in greater or less abundance in San Diego Bay during the latter part of April, the whole of May, and at least a part of June. The eggs are deposited at about five o'clock in the evening. They are pelagic; the only difference between the eggs of the two species seems to lie in the slight difference in size and in the number of oil-globules, Hypsopsetta invariably having one, Sciaena from two to eight.

The eggs were carried a mile before they could be studied, so that, in the earliest stage observed the blastodisk was segmented into four cells. The embryonic ring and shield appear in about twelve hours; the blastopore closes in about eighteen hours; the embryos are freed from the membrane in less than thirty-six hours. At the closing of the blastopore, the embryo and a part of the yolk are covered with scattered chromatophores. At this time the individual chromatophore is a large cell with a distinct nucleus and a few color granules; there may be present one or

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two pseudopods; the dendritic form is not developed for some time. The color granules of most of the cells are brownish-yellow; those of comparatively few cells being black. The cells are so large that they may readily be distinguished before any color is deposited in them. The term chromatoblast may properly be restricted to them at this colorless stage. There are no chromatoblasts distinguishable when the embryonic shield begins to form; they first appear when the gastrula covers one-third or one-half the yolk. *They are proliferated into the segmentation cavity from the embryo, where the latter joins the embryonic ring and from here they migrate to various portions of the embryo.* Just how they arise I cannot say, as means for sectioning are not at hand. Further observations of living eggs may clear this point. As the gastrula advances over the yolk they increase in number very rapidly, but, as far as I have observed, by the process of proliferation only.

They are somewhat angular in shape, the angles being sometimes prolonged into pseudopods. Their depth at this time is equal to that of the segmentation cavity. In their migration the pseudopods are usually foremost; amoeboid changes in shape were not observed, the whole cell moving forward. Most of the chromatoblasts are collected along the margin of the embryonic shield. When the embryonic shield narrows and the embryo becomes more definitely outlined the chromotophores rapidly migrate inward and cover the embryo, while others collect about the oil-globules and but few remain over the yolk. Shortly after the closing of the blastopore in Scieana the oil-globules unite and the eggs of this species can then be distinguished from those of Hypsopsetta only by the very slight difference in size.

The chromatoblasts cannot be confounded with any other elements. They are approached in structure and position by the cells of the epiblast when about to divide. Such cells rise out from among the surrounding cells and project into the segmentation cavity, divide, and again sink to the ordinary level.

As chromatoblasts cannot be observed continuously from their origin to the chromatophore stage, should this process extend over several days or weeks, it is not possible to say positively whether the color-cells of the genera Oligocottus, Isesthes, etc., have a similar origin. The fact that their genesis in so widely different genera as Hypsopsetta and Sciaena is identical, would indicate that the color-cells in all fishes are developed in a similar manner. *Carl H. Eigenmann.*

* Preliminary Notice.

CONTRIBUTIONS TO WEST AMERICAN BOTANY.

In this series of papers it is proposed to present in a connected form, such botanical observations as may be made by the writer, that may seem to contribute to a fuller knowledge of our West American flora. It is hoped that these may become worthy of the

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above title as herbarium material and available literature increases. While much still remains to be done by the systematic botanist, it is believed that our flora offers a wider field for observations in other directions and of greater value to botanical science.

HOSACKIA (SYRMATIUM) HAYDONI.—Suffrutescent, six inches to a foot or more high, the slender stems woody at base, at first slightly spreading, then recurving inward and slightly intertwining, forming a loosely-compact bush, glabrous or nearly so throughout: leaflets three or less, oblong, obtuse, one to two mm. long: flowers single or more rarely in pairs, short pedunculate, two mm. long: calyx of equal length, the teeth narrowly subulate, erect, a half to one-fourth as long as the tube: pod but slightly incurved, usually twice the length of the persistent calyx, one seeded: seed dark olive-green, two and a half mm. long, slightly curved.

I take pleasure in dedicating this delicate species to Mr. Marion D. Haydon, in return for his hospitality and for his directing my attention to various forage plants whose valuable qualities had previously been unsuspected. Collected in April, 1889, growing among the rocks in a canyon leading into the Colorado desert, on the old stage line from San Diego to Ft. Yuma. With H. glabra, Torr., this plant is commonly known as the deer weed, but its smaller growth will render it less valuable for cultivation and it is apparently too limited in its distribution to assume importance as a wild forage plant.

STAMINODIA AND STAMENS.—In examining a large number of the flowers of Hookera minor, Britten, in the field this spring, I was somewhat surprised to find numerous specimens in which the staminodia were changed to perfect, fertile stamens. The first instance noticed was in a flower evidently injured by some insect, but so many examples were found later, where the staminodia were partially or wholly changed into anther-bearing stamens that I cannot ascribe it to the work of insects. This illustrates how little value can be placed in this genus on the unreliable characters of the stamens and staminodia.

HOOKERA ORCUTTII.—Greene, Bull., 6, Cal. Acad. Sci. 138. This species has been well characterized by Prof. Greene and is a very distinct species. Having examined a large number of the flowers in the field this season, I can speak positively of the absence of any traces of staminodia in any that I collected, and only three stamens were ever present. I first collected this species in 1882 in a valley about thirty miles north of San Diego, and later in the unusually wet seasons of 1884 and the present year. I found it abundant on our mesas, often associated with H. minor, Brit. The bulb is large, with a thick, fibrous envelope.

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TREES AND SHRUBS OF SAN DIEGO COUNTY, CALIFORNIA.

In the first bi-ennial report of the California State Board of Forestry, (1885 86), I contributed at the request of Hon. Abbot Kinney, a short paper under the above title. In it I briefly noted the general distribution in the county, of the ligneous plants that were known to me; thus it was necessarily incomplete, and some species were omitted as being scarcely worthy of mention. The article was further marred by a multitude of typographical errors and even whole pharagraphs by other authors were wrongly inserted under my signature.

Botanical science would not have been seriously affected, however, had the history of this unfortunate paper ended with the report of the California Board. But Hon. B. E. Fernow, chief of the Forestry division of the U. S. Department of Agriculture, saw fit to criticise my gratituous work as incomplete, in his second bulletin,(page 198), and, without consulting the writer or others who have had opportunity for an acquaintance with the subject, presented 'a complete list' of the trees and shrubs of San Diego county (pp. 202-5). This 'complete list' was compiled mainly from Watson's Botany of California, by Mr. Geo. B. Sudworth, and fully seventy species belonging to our flora was ommitted, and nearly a score of species were erroneously admmitted by him. Thus its scientific value was wholly destroyed, and curiously enough the compiler of this 'complete list' omitted nearly all the species enumerated in my paper, that were not mentioned in Watson's Botany.

The very evident worthlessness of this 'complete list' was enough to render criticism almost needless. But now a second edition of Bulletin No. 2, of the Forestry division comes to hand containing a list purporting to be a 'modification of that in the first edition.' In an editorial note the Chief says:

"The modifications have been made upon the authority of Mr. 'C. R. Orcutt and Dr. S. B. Parish, both of San Diego county, 'California. Thanks are especially due to Dr. Parish, who is 'writing a flora of this region, for the addition of several unpub- 'lished species. The cacti, and other plants not truly shrubs or 'trees, have been omitted. A few species, however, not always 'woody throughout, have been inserted. The fact that Mr. Kin- 'ney submitted a list confined to San Diego county must explain 'the insertion of such a limited list, while it would have been de- 'sirable to embrace the flora of Los Angeles and San Bernardino 'counties as forming a true botanical region."

This explanatory note of the Hon. B. E. Fernow is almost as unfortunate as the rest of the history of this article. A letter to the Chief criticising the 'complete list' (by which the first edition may most conveniently be designated) with his apologetic reply, forms the whole of the correspondence between us, and the mod-

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ified list has nearly the same omissions as the 'complete list,' notably, the Rhus ovata, Cixpressus Guadaloupensis, Berberis Fremontii, and other well known trees and shrubs of our county, and even the palm was ommitted from the 'complete list.' Mr. S. B. Parish, of San Bernardino, (*not* San Diego), who has an extensive acquaintance with the flora of Southern California, requested information relative to certain species that were included in the 'complete list' and after furnishing him with my notes, he informed me that a revision of the 'complete list' was in progress and that he would forward my notes for use in the revision. Evidently Mr. Parish has had as little to do with the 'modified' list as myself and should not be held in any way responsible for its errors. Only one species, Euonymus occidentalis. Nutt., is directly credited to me, and the unpublished name of Dr. Treleas, (E. Parishii) which is proposed for doubtless the same shrub, is given as a second species of this genus.

It is sincerely to be regretted that sueh inaccuracies should appear in even this comparatively unimportant paper in a publication of our government, as it tends to throw suspicion upon all the work of the Forestry division. and perhaps not with injustice in this case. So important an interest as our forests is worthy of the most careful and intelligent treatment, such as it receives at the hands of foreign countries.

It is not advisable at present to compile even an approximately complete list of our ligneus plants, pending the elaboration of recently collected herbarium material and copious field notes.

Our Forests.

The true forests of San Diego county are, properly speaking, restricted to the higher mountainous region, comprising the Laguna, Cuyamaca, Smith's and San Jacinto mountains, usually at an altitude of 5,000 to 7,000 feet or greater. Considerable timber exists in these mountains, and at San Jacinto, saw-mills are continually at work, supplying the immediate vicinity with lumber, but none is exported. The timber is less valuable as a rule than that found at the north. Pine, and a little spruce and cedar, is the principle timber utilized. These forests are composed mainly of the following trees:

Pinus Lambertina, Dougl.	Pseudotsuga Douglasii, Carr.
Pinus ponderosa, Dougl.	Libocedrus decurrens, Torr.
Pinus Coulteri, Don.	Abies concolor, Lindl.
Pinus Sabiniana, Dougl.	Quercus chrysolegis, Liebur.
Pinus Jeffreyi, Murr.	Quercus Kelloggii, Newberry.

Pinus Sabiniana, Dougl., is not known to the writer but has been credited to the county. The only form of Pseudotsuga Douglasii, Carr., known by me to occur in the county, is the variety macrocarpa, Engelm., which does not approach in size the grand spruces of the north.

C. R. Orcutt.

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EPOCH OF THE MASTODON IN NORTH AMERICA.

The most interesting of the animals that have recently, (in a geological sense), become extinct, is probably the American mastodon, (Mastodon gigantes) which, in connection with the mammoth, or fossil elephant, (Elephas primigenius) appears to have attained a great numerical development upon this continent at about the close of the Pleistocene, or the commencement of the Post-tertiary epoch. Geologists are enabled to determine with certainty the age at which these colossal herbiverous animals existed in this country, from the circumstance that their bones are found in a partially petrified or sub-fossil state, in superficial deposits, lying above the drift formation, as for example in peat-bogs or the mud and marl deposits of existing ponds and lakes, the origin of which, it seems, cannot extend far back of the introduction of man upon this continent. Some have thought that the mastodons and mammoths did not become entirely extinct in this country until after the advent of man, and find a support for their opinion in various traditions of the North American Indians, which represent their ancestors as warring against certain colossal animals, which are described as tree-eaters, and as never lying down, but leaning against a tree when they slept. Sir Charles Lyell, however, after a review of all the facts in the case, has arrived at the opinion that the period of the extinction of the mastodon, although geologically modern, must have been many thousand years ago. Judging from the distribution of their bones the mastodons appear to have existed most numerously in the valleys of the Ohio and Mississippi, and from thence to have roamed as far to the northeast as New York and New England. Their remains, however, have been but rarely found in New England, and it has been conjectured that the Hudson river may have acted as a barrier to their migrations. The mammoth, or fossil elephant, appears to have roamed over the same territories contemporaneously with the mastodon, but in much smaller numbers. In the western States the bones of these animals are found most commonly in the low places around the salt-lick spots, that are still frequented by deer and other wild animals that come to lick up the saline waters. At one such locality in Kentucky, known as the "Big Bone Lick" about twenty miles south west from Cincinnati, it is esitmated that the bones of one hundred mastodons and twenty mammoths have been dug up together with the bones of the megalonyx, buffalo, deer and other animals. The most complete skeletons of the mastodons have, however, been found in swamps and peat-bogs, in which the animals were probably accidently mired and suffocated. The finest and largest skeleton in existence was discovered by some laborers engaged in digging marl from a swamp in Newburg, N. J., in the summer of 1845. It occupied a standing position, with the head raised and turned to one side and the

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tusks thrown upwards the position natural to a quadruped when sinking in the mire. In the place where the stomach lay, and partially enclosed by the ribs were found about seven bushels of vegetable matter--i.e., bruised and chopped twigs and leaves--which, without doubt, represented the food last eaten by the animal Some of these twigs, subjected to microscopical examination proved to be those of a coniferous tree, probably the white cedar. This skeleton was purchased by the late Dr. John C. Warren of Boston and is now preserved in that city. Its dimensions are as follows: Length, twenty-five feet; height twelve feet; length of tusks, ten feet. The total weight of the bones is two thousand pounds, and so slightly changed are they that they still retain a large proportion of their animal matter. In some instances there have been found in connection with the skeletons of the American mastodon, tufts of hair of a dun-brown color, varying in length from two to seven inches—thus indicating that the animal, like the Siberian mammoth, might have been fitted to endure a climate considerably colder than that in which the present elephant lives. *G. D. Story.*

OPUNTIA FRUIT AS AN ARTICLE OF FOOD.

One of the most attractive fruits in the markets of Mexico and one that is always in demand is the fruit of the Opuntia, or *Tuna* as it is known to the Mexicans. Both the foreign and native inhabitants consume it, and with many, it forms the principal article of food for months in the year.

The seeds of some of the choicest varieties sold in the markets of Mexico were obtained and grown by the U. S. Department of Agriculture for distribution in localities suited to their cultivation. The *Tuna* of the Mexicans must not be confounded with Opuntias found in Arizona, New Mexico and Southern California the fruit of which is not utilized.

What is known as the cactus belt of Mexico furnishes many very fine species of Opuntia adapted to cultivation. When brought together, and each variety receives a name, as other cultivated fruits are distinguished, they will severally be sold and esteemed for their respective merits. Then especial growers of this cactus will appear and new varieties be produced by cross-fertilization and other means as in our northern fruits.

The potato and tomato when first introduced were little valued because their qualities were unknown; now the world would not care to do without them. The Opuntia fruit will be prized wherever known.

CULTIVATION.

Scarcely a plant known to man requires so little care in its cultivation as the cactus. It will grow in nearly any soil, but best in light sandy or gravelly combinations. The Opuntia reaches

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the greatest perfection on the table-lands of Mexico, where owners of estates have assured me that they have realized beyond all expenses $3,000.00 to $5,000 00 annually from the sales of this fruit and its products.

The Opuntia takes root readily when a piece of plant is laid on the ground, or a little soil may be thrown on the top of a joint, so easily is it cultivated. It will stand considerable cold, and draught does not effect it beyond causing the plant to wilt at times, from which it quickly recovers. The dryness during the most protracted drought seems to increase the sweetness of the fruit.

Give the Opuntia one-tenth of the care in its cultivation that the peach requires and it will repay you with a delicious fruit that lasts for a much longer period for market; one better for shipment; one with good keeping qualities. No insects to molest it no dangers from frost, as it blossoms after the time of frost, and protected from thieves by its spines, you can enjoy its fruit unmolested. There are some who dislike all forms of cactus because of their spines, and consider them useless, but this is a mistake. All cacti are useful to animals and birds and may be utilized by man, and the spines simply prevent their rapid destruction by animals that would greedily devour these succulent growths were they not protected.

REMOVING THE SPINES.

When the fruit of the Opuntia is ripe, the fine spine upon their surface are readily removed by taking a bunch of grass, or any other suitable thing and switching the fruit, thus removing easily the downy spines, which, if not removed, would cause a little pain for a short time in handling the fruit. I have seen persons born among the *Tunas*, catch the fruit suddenly near the summit and wrench them off with their fingers apparently without suffering any evil consequences. If the spines are not removed at gathering, the fruit will have to be wiped before the rinds are removed, to prevent pain to the operator.

GATHERING THE FRUIT.

There are three methods resorted to in gathering Opuntia fruit; one with the hands; second, by wooden tongs; third, with a knife. The first method can only be resorted to when the plants are low, or in gathering from the lower branches of a tall plant. By taking hold of the fruit with the fingers and giving it a sudden twist it at once detached. This is no doubt the best method of gathering for market, as there is less bruising, and if the spines were previously removed, can be at once packed for market or the "jackets" removed for immediate use. The second method of gathering the fruit by means of wooden tongs is, so

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far as the writer knows, only resorted to by Indians, who gather for their own consumption.

The knife in the hand of an experienced gatherer, can be made to detach a great quantity of fruit in a day. It is much used along the table-lands of Mexico on the great estates where the Opuntia grows to perfection; and the fruit by various means rendered profitable to the owners. The blade of the knife is made of steel and is inserted into the split end of a long strong stick, the length of which enables the gatherer of *Tunas* to reach with the knife blade the joint bearing ripe fruit. The plants are often eight to fifteen feet high. The fruit is arranged around the outer rim of the joints, so, when the gatherer brings the knife blade to the joint, he separates by a quick turn that part bearing the fruit, and as quickly thrusting the blade into the severed part, brings it to the ground, when the fruit it soon denuded of its fine spines and removed. Plants present an odd appearance after the terminal joints have been thus removed, but suffer no injury and the fragments readily take root and form new plants.

REMOVING THE SKINS FROM THE FRUIT.

It is surprising what a quantity of fruit can be deprived of skins and prepared for the palate by one pair of experienced hands. A thin slice is removed from each end of the fruit; a slit is then made through the peeling along the length of the fruit. The fingers press downward quickly the separated skin leaving the pulpy fruit exposed in a tempting manner. Thus prepared, the fruit is one of the sweetest, most nutritious and refreshing of fruits, mealy and juicy, most agreeable for the warmer seasons of the year in the United States. Especially is this fruit adapted for the breakfast-table, when the languid body needs something to aid digestion. If kept as cool as a watermelon, it will prove far more agreeable than that fruit, being of a similar flavor with that of the strawberry added, and it is healthier, more nutritious and longer in season than the watermelon.

This fruit is to be found in the Mexican markets in abundance and very cheap five months in the year, and is consumed by all classes and conditions of people. Venders are to be seen along all the roads. Along the Mexican Central Railroad the earliest Tuna is ripe in June and the latest varieties disappear in November, and you are offered them in small dishes, with the epidermis removed, a thorn from the mesquit tree to carry the tempting morsel to the mouth.

This fruit is finding its way all along the frontier of the United States, and this winter I saw some fine fruit on a stand in Jacksonville, Fla., for sale.

Americans and foreigners consume this fruit with equal avidity with the Mexican and praise the flavor. When as well known in this country as in Mexico it will be utilized to the fullest degree.

Edward Palmer.

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SOME NOTES ON TERTIARY FOSSILS OF CALIFORNIA.

PACIFIC BEACH.

An exposure of a deposit of tertiary fossils occurs at Pacific Beach, San Diego, California, on the ocean bluff north of the pavillion, extending for about a mile along the ocean beach and from five to twenty feet above tide water. In May and June, 1888, I made a small collection at this point, of which the following is a partial list:—

Olivella *biplicata.*
" boetica.
" sp. indet.
Conus Californicus.
Surcula Carpenteriana.
Monoceros engonatum.
" var. spiratum.
Ranella Californica.
Opalia anomala, Stearns.
" varicostata, "
Siphonalia Kelletii.
Janira bella.
Pecten hastatus?
" æquisulcatus.
" 3 sp. indet.
Tapes staminea.
Scalaria sp. indet.
Neverita Reclusiana.
Norrisia norrisii.
Pandora (mold only).
Fusus ambustus.?
Acmæa mitra.
" *insessa.*
Anomia lampe.
Ostrea lividus.
Lucina Nuttallii.
Cerithidea sacrata.
Amphissa versicolor.
Amycla carinata.
Dentalium hexagonum.
Cardita subquadrata.
Littorina scutulata.
Pteronotus festivus.
Crepidula *adunca.*
" unguiformis.
Nassa *cooperi.*
" perpinguis.
" fossata
Omphalius aureotinctus.
Chlorostoma Pfeiferi.
" *gallina.*
Haliotis splendens (*fragment.*)
Tellina bodegensis.
Pomaulax undosus.
Macron lividus.
Ocinebra poulsonii.
Calliostoma gemmulatum.
Tivela crassatelloides.
Drillia penicillata.
Myurella simplex.

There were about a dozen other species, not identified as yet, among them a curious form resembling an oyster valve, very thick, but too imperfect for me to determine its character.

A whale barnacle, a fine shark's tooth, numerous bones of some large animal, caseings resembiing those surrounding the shells of Lithoglyphus, calcareous tubes of Serpulorbis squamigerus, and numerous specimens of Echinarachnius excentricus were also obtained in this stratum. The locality is worthy of much more careful study than I have yet given it, but the above will prove sufficient to indicate its character. Three imperfectly defined strata can be here detected:—The older turned to sandstone, containing molds of various bivalves, and the imperfect valves above referred to as slightly resembling the oyster; the second containing the Opalias, Janiras and Pectens and a species of Terebratula (?); the third, more recent in character, containing the most of the other species.

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FALSE BAY.

Along the shores of False Bay, which bounds the tract known as Pacific Beach on the south, are found numerous large deposits of shells, formed largely of Donax Californicus in places, and containing remains of echinoderms, besides other mollusks. These need to be studied in connection with those before mentioned, but I have as yet given them but small attention.

OCEAN BEACH.

Ocean Beach lies south of Pacific Beach, with False Bay between them. Both lie within the limits of San Diego city. About two miles south of Ocean Beach, near the top of the cliff, about forty feet above tide water, I found another exposure in June, 1888, where I made a collection of about fifty species of shells, including those species given in italics in the Pacific list, and the following additional shells.

Omphalius fuscescens.
Monoceros lugubre.
Lottia gigantea.
Acmaea spectrum.
" pelta.
" scabra
Gadinia reticulata.
Fissurella volcano.
Calliostoma canaliculatum
Glyphis aspera.
Crepidula lingulata.
" dorsata?
Petricola carditoides.
Chama exogyra.
Balanus 3 sp. indet.
Vermetus ? sp.
Hipponyx sp. indet.
Chiton (valves).
Haliotis cracherodii.
Drillia moesta?
Monoceros sp.?
Leptothyra sp. indet.
Volvarina varia.
Bittium sp. indet.
Cumingia Californica.
Lucina Californica.
Platyodon cancellatum.
Zirphoea crispata.
Septifer bifurcatus.
Pachypoma gibberosum.
Strongylocentrotus sp.?
Serpulorbis squamigerus.

This is a very promising locality, and a much greater variety may be expected after a more careful and thorough examination of the whole exposure—only a small part having been examined by myself.

ROSEVILLE.

From a cliff at Roseville, nearly east of the Ocean Beach locality and on the shore of San Diego bay, were numerous valves of Pecten æquisulcatus, Chione simillima and C. fluctifraga, imbedded in the soil a few feet above tide water. Other similar deposits are not rare along the bay shores. *C. R. Orcutt.*

THE REPUBLIC OF SALVADOR.

A little over thirty miles south of San Jose de Guatemala begins the republic of Salvador, the smallest, though the second in point of population of the countries of Central America. The little republic is indeed the most densely populated country in both Americas, with exception, perhaps, of some of the lesser

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Antilles, for the Salvadorian Republic contains only an area of a little over 7,000 English square miles, while the number of inhabitants is nearly 800,000.

Salvador was always regarded as a very rich country, and before the conquest was called by the natives, "Cuscatlan," or the land of abundance. The country was already at that period very densely populated, and its inhabitants were warlike and fierce. They defended their independence in such a spirit that it required all the energy of such a man as Pedro Alvarado to conqueror and to bring them under the Spanish dominion.

Nowadays, though Salvador suffered and suffers still from constant wars and insurrection, the country is fairly prosperous, well governed, and the best educated republic of Central America. Agriculture is extensively and successfully practiced, and the export of the products of the country is augmenting every year.

As I leave the shores of Guatemala and approach those of Salvador I remark the difference between these countries. The coast of Guatemala is low and sandy with the mighty chain of the Andes far in the interior; that of Salvador is high and rocky and of volcanic origin. There is no sandy beach here, but the hills descend to the waters' edge and form a steep fantastic shore, not barren and wild, but green and covered with a crown of the most exquisite trees and parasitic plants.

The first harbor I meet on the coast of Salvador is Acajutla. It is a considerable town as the export place of the northwestern part of the republic. It is connected by railway with the city of Sonsonatte, further in the interior, one of the most important places in the republic.

Acajutla looks half like a city and half like an Indian village. The houses as usual are low, but the streets are paved. But what a pavement! I believe that even the streets of San Francisco have a better pavement than those of Acajutla. It is a torment for the poor barefooted Indians to walk on those streets, and even those who use shoes or boots are very anxious to avoid them.

The houses of Acajutla, and especially outside of the town proper, form a very curious sight. They are constructed of bamboo or rather coyoles branches and are protected by enormous and very high fences. But those fences are neither of wood, nor of stone nor wire, but of cactus. The cactus and especially the giant cardon grows here to an enormous size and very rapidly. Planted around the house in a short time it will grow to a considerable hight and will form a most magnificent and durable fence. No animal and no snake can force such a formidable fence and the inmates of the house can rest secure. Sometimes the giant cardon reaches the stupendous height of sixty

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feet, and when this is the case, you cannot see the house, but only a green and high palisade of tall and prickly cacti.

From Acajutla to La Libertad the shore of Salvador is known under the name of Costa del Balsamo, or Balsam Coast. It is a magnificent part of the republic, green and fresh, fragrant from the odor of numerous gorgeous flowers, watered by many mountainous creeks, covered with numerous haciendas and fincas. The hills, not too high or too steep, run in soft undulations to the shore, while toward the east they become higher and higher until they meet the principal chain of the Andes. The Balsam Coast itself produces indigo, sugar, cotton, tobacco, coffee and maize, and is of extreme fertility. But the glory of the coast is the famous balsam, known as "Balsam of Peru," which is produced in the woods of this coast in such quantities that over 30,000 pounds are annually exported.

Speaking about balsam, I must mention that under this term we understand now the balsams of Peru and of Tolu. Both balsams have a very fragrant odor and they are used in confectionary, in perfumery and especially in medicine. The two balsams mentioned are very similar to each other in their properties and both are produced by trees of the genus Myroxylon, or Myrospermum of the Leguminosae, Myrospermum peruiforum, commonly called the "Quinquino," grows in abundance in Central America, and chiefly from this beautiful tree is prepared the celebrated balsam of the coast of Salvador. Myrospermum toluiferum is a very similar species to the former, but grows mostly on the banks of the Magdalena river and in the mountains of Venezuela and New Granada. The mountains of Tolu gave the name to this balsam.

At the end of Costa del Balsamo we meet the fair town of La Libertad, the second harbor on the coast of Salvador. The scenery around the town is magnificent; in fact the prettiest on the coast, for just behind the harbor begin the hills, covered with the most costly woods and with magnificent fruit-bearing trees of the topics. The cool stream, the river Chillama, runs close to the town; and on its banks the luxuriant vegetation reigns in its supernatural beauty. Over the houses of the town tower the high cocoanut trees laden with fruit, and close to them lingers the graceful curica, papaya, ceiba, henisaro, matapalo, guayago del monte, guiscoyol, mahogany and nispero form dense groups; feathery, delicate leaves of banana and plaintains shine with the color of purest emerald under the glowing sun, and the taller columnar cardon cactus shoots like an arrow towards the blue sky.

The town of La Libertad is a small, delightful place, composed of low adobe houses, surrounded by luxuriant gardens. It is the harbor of San Salvador, the capital of the republic, and all merchandise destined to that place has to go through La Liber-

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tad. The coach runs from the harbor to the capital, which is situated further in the mountains, on a high volcanic plateau.

San Salvador is now a fine and well built city, though it has none of its former splendor. In 1854 it was a magnificent city, with many churches,palaces and splendid buildings, but on the night of April 16th, of that year, it was completely destroyed by one of those terrific earthquakes which are so frequent in Central America. The city was rebuilt and was again partly destroyed in 1873. It remains, however, always the seat of government and the capital of the republic.

The inhabitants of San Salvador pride themselves on being the most polished and the most cultured in Central America. They read a great deal and study much, and are, without question, better posted on all social and political questions than are their neighbors of Honduras or Guatemala. The ladies study also a little, and willingly discuss all known, or unknown questions with anybody who happens to come in their way. With strangers they are free, bold and very anxious to know what the ladies in other countries do, how they dress and how they spend their time. The Salvadorian ladies flirt a little more than their sisters in other Spanish-American republics, and are very anxious to marry early. In fact, it is regarded as a disgrace if the lady does not marry. The Salvadorian ladies compare favorably with their sisters in Guatemala or Nicaragua. They are affectionate; generous. but quick tempered; brilliant, but superficial; vain and vacillating; courageous in the highest degree, but capricious. They like the song and dance, but not so much as the ladies of Leon.

South of La Libertad the coast is very rocky and steep, and contains no harbors until we reach the beautiful gulf of Fonseca. In that magnificent expanse of water Salvador possesses the old Spanish town and harbor of La Union.

La Union has a suffocating climate, for the harbor is landlocked and the fresh sea breeze seldom enters. It is burning hot everywhere and you breathe the air of a furnace. Had Charles Dickens been in La Union he would never have described Marseilles as he did in "Little Dorrit," for Marseilles compared with La Union would have been an arctic place. Here in La Union everything is hot; the wind, if there is any, the staring dusty streets, the sandy beach, and even the water within the harbor. The people do not walk on the streets in the daytime if they can avoid it, but remain at home smoking and swinging in large comfortable hammocks, for the hammock in this *tierra caliente* takes the place of a bed and very often of a chair.

La Union is a considerable but a very lazy and lifeless place. Only when the fair takes place--and this happens a few times every year—the inhabitants loose their lethargy and are as gay and

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frivolous as the inhabitants of Leon and Puntarenas. They sing and dance and make love like veritable children of the sun.

The Andes of Salvador form a highly volcanic central range with no less than sixteen volcanic peaks from four to eight thousand feet high. The volcano Isalco near Acjutla is always in eruption, and the traveler can constantly see the fire and smoke, and hear the roar of ejected lava. Salvador possesses also many lakes and rivers, as for instance the lakes Guija and Llopango and the river Lempel and San Miguel. There are many considerable cities and towns in the interior, and among others are Sosonatte, Santa Ana and San Miguel. The richness of the country consists mainly of the products I mentioned before, and especially of tobacco, the best in Central America. The mineral wealth is not great, although there are some silver and iron mines near Santa Ana and Tabanco.

The government of the republic is carried on by a president, vice-president and two ministers. The legislature consists of two chambers, an upper one of twelve senators and a lower of twenty-four representatives. The standing army is only 1,000 men, though in case of necessity everybody is called to arms. In the last struggle with Guatemala (1885) Salvador in the short space of a few days had an army of 12,000 men, and what an army it was the battle of Chalchnapa has shown.—*M. Lopatecki.*

NATIVE PLANTS OF AUSTRALIA.

Australian plants have proved in many cases equally well adapted to the soil and climate of the Pacific Coast. The director of the Technological Museum, Sydney, furnishes an interesting book on the useful plants of that continent, from which we glean the following notes of some, as yet unknown to this coast.

It may not be generally known that Australia produces an indigenous hop, which in the early days of settlement, was extensively used for making yeast and beer.

Eucalyptus dumosa yields a kind of manna, which is eaten by the natives in some parts of Victoria. It is the nidus of an insect and is a starch-like substance resembling small shells, white or yellowish-white in color and sweet to the taste.

The settlers of Tasmania obtain a kind of cider from a species of gum, and another species (Eucalyptus Viminalis) also yields a sweet manna.

The native cherry (Exocarpus Capressiformis), has excited considerable attention in Europe from the fact that, contrary to the usual order of things, the stones grow outside of the fruit.

Baron von Muller recommends the culture of Geitonoplesium cymosum as a substitute for aspargus.

The native peach or *quandong*, Fasauns accuminatus, makes

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an excellent preserve or jelly and may be dried and used like preserved apples.

In waterless localities the fleshy roots of the needle or pin-bush Hakea leucoptera, yield good drinking water to those who understand how to get it.

The Rumquat or desert melon, Atlantia glanca, may be made into a fair preserve.

An infusion from the fragrant bark of the sassafras, (Atherosperma moschata) is used in the form of a beer and has a pleasant taste when taken with plenty of milk.

The natives of New South Wales and Queensland prepare a cake which resembles a coarse ship biscuit from a bean tree known as *Italic* or *Bogum*.

In cases of severe thirst much relief may be obtained by chewing the leaves of the shingle oak (Casnarina stricta.) Being of an acid nature the chewing of the leaves produces a flow of saliva.

The native currant (Coprosura Billardieri), the *Moor* of the natives of Coranderrk station was formerly used by the settlers in making puddings.

BRIEFER ARTICLES.

PRESERVING THE COLORS OF FLOWERS.—A process of preserving the colors of flowers in dried specimens, as used in Berlin, consists of steeping the plants in a solution of sulphurous acid containing one-fourth of its volume of methylated spirit. Delicate flowers require an imersion of but five or ten minutes, and thick leaves as much as twenty-four hours. They are then removed, the fluid is allowed to evaporate, and the plants are dried between paper in the usual way. *Sci. American.*

A PETRIFIED BIRD'S NEST.—Harlan H. Ballard, President of the Agassiz Association, describes in *St. Nicholas* for June, his experience with a petrified bird's nest containing three eggs. It is a useful article and a timely warning against being "taken in" by any apparently wonderful production of nature. These nests it seems, are prepared in Italy by immersing in water impregnated with mineral salts, thus producing an artificial petrifaction. It may be well to note the distinction between the words, petrifaction, and fossil, which are too often used as synomyns: a petrifaction may be defined as anything "turned to stone," or encrusted by a mineral substance, and may be either natural or artificial; a fossil is "a substance dug from the earth," or plant or animal remains (petrified or otherwise), from the strata composing the surface of the earth. It would not be strange if the nest described by Prof. Ballard had been a natural petrifaction as he supposes it may be but for the presence of *three* eggs. It would be possible for a bird in our western country to build and hatch its young in such a situation as he describes, where the nest at a different season might be subject to the overflow of a non-peren-

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nial spring, and one egg failing to hatch, might have remained in the nest. I have seen such a locality where the still green and growing moss was slowly but surely becoming petrified (*i. e.*, incrusted by a mineral, deposited on its surface, by the water flowing over it), while other mosses had become wholly petrified. The vegetable substance in some specimens had decayed, while in others, only the fibres, incrusted by a calcareous substance, still remained. Specimens of petrified moss are not rare from the State of Michigan, but the locality I refer to was in the mountains of Lower California, and I am confident that the "water is dry" a great portion of the year and would not interfere with nest building, should a bird select the site and begin operations before the rainy season. *C. R. Orcutt.*

ALBINISM AMONG FLOWERS.—The editor has collected specimens of each of the following plants bearing only pure white flowers. Usually the whole plant was of a lighter green than that of the other plants which bore flowers of the normal hue.

Delphinium decorum, F. &. M.	Brodiæa capitata, Bth.
Linaria Canadensis, Dum.	Sidalcea humilis, Gray.
Mirabilis Californica, Gray.	Gilia dianthoides, Endl.
Orthocarpus purpurascens, Benth.	Erythræa venusta, Gray.

A single plant of Mimulus cardinalis, Dougl., was once found in Lower California, with yellow flowers, which a well known botanist proposed to call a new species, but I advised him of its true character in season.

The Erythræa venusta, Gray, is often pure white and runs through the lighter shades of purple into its normal color. In the wet spring of 1884 I secured so many large and beautiful white-flowered specimens of this, as to lead Dr. Gray to inquire if it was not a valid species. The plant is very variable otherwise as to size and shape of foliage and flowers. *C. R. Orcutt.*

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

SAN FRANCISCO MICROSCOPICAL SOCIETY,—June 12th, 1889. A. H. Beckenfeld, the Vice President, was present for the first time since recovering from his severe illness, and was cordially welcomed. His contribution to the evening's programme represented some fine specimens of Melacerta ringens, a tube-building rotifer, belonging to the family of wheel animalcules. This variety is considered the most beautiful of the species, and builds for its protection an ingenious tube, which it forms of round pellets that are elaborated in the interior of the animalcule, and securely gummed together with a secretion derived from the same source. This rotifer, when feeding, extends itself partly from its tube and by means of several rows of cilia produces a rapid rotary motion one set of cilia drawing a current of water containing food to its mouth, while another row ejects the debris by a current produced

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in an opposite direction. The tube and occupant are highly transparent and viewed by dark ground illumination never fails to excite astonishment and wonder at the sagacity displayed by nature in protecting these minute organisms from their enemies and furnishing them with such elaborate means for obtaining their subsistence. Mr. Breckenfeld also exhibited a slide of Æcidium or "cluster-cup fungus" found infesting the scanty vegetation on Signal Peak, Yosemite Valley, some seven thousand feet above sea level.

Dr. E. G. Clark exhibited some interesting slides of Cinnabar ore in Chalcedony, showing free mercury, a rare thing in the natural state. The gentleman also showed a beautiful mounting of chrystallized gold, displaying the peculiar fern-leaf disposition of the chrystals produced by the galvanic current.

The most notable feature of the evening was the exhibition by Charles C. Riedy of his collection of old and rare works of the early writers on microscopy. To the student and all interested in micrographical literature this was an opportunity seldom offered to examine many volumes published by the pioneers in this branch of science, that are now very scarce. Mr. Riedy is devoted to the study of the Infusoria, and to facilitate his inquiries in that direction the present collection has been slowly accumulated, though not without great difficulty and perseverance, many of his orders for special works having been several years in the hands of European book-dealers before they were obtained. The different volumes cover the entire field of microscopical research from its very beginning, and contain a complete resume of the evolution of optical science, together with the progress of mechanics as applied to the microscope. Many of the editions, in fact a majority of them, contain a high grade of illustrations considering the date when they were executed, while some are embellished with fine-lined copper-plate engraving that would do credit to our own day. The oldest publications, belonging to the fifteenth and sixteenth centuries, are all bound in heavy parchment, and mostly written in the scholarly language of the time—Latin. The printing is remarkably good and legible, there being no perceptible fading of ink or paper. The authors represented were Adams, Baker, Baster, Bonanni, Descartes, Ellis, Eichhorn, Gleichen, Gotze, Grew, Hill, Hooke, Joblot, Ledermuller, Leeuwenhoek, Martin, Needham, Power, Redi, Schaffer, Glabber, Smith, Spallanzani, Schott, Swammerdam, Trembley. Notable among these are Decartes' works, with numerous wood-cuts, small quarto, Amsterdam, 1650. This work contains an illustration of Descartes' gigantic microscope eight feet high.

In the collection is Powers' "Experimental Philosophy, in three books, containing new experiments, microscopical, mercurial, magnetical." London, 1664. This last work is the earliest volume on the microscope in the English language.

Before adjourning a unanimous vote of thanks was tendered

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Mr. Riedy for his interesting exhibition of what is certainly the most unique collection of rare microscopical literature in the United States. *C. P. Bates, Rec. Sec.*

SANTA BARBARA SOCIETY OF NATURAL HISTORY.—May 25, 1889. Dr. L. G. Yates presented a specimen of Allanite from Santa Barbara county, and read a paper on this new and rare mineral. Mr. Goodyear, of the State Mining Bureau, in a letter to Dr. Yates, stated that the portion of Santa Cruz Island already examined to be mostly volcanic rock.

BIBLIOGRAPHY.

L.H.BAILEY. Studies of the types of various species of the genus Carex. Mem Torr. Bot. Club, Vol. 1, No. 1., New York, 1889, 8vo pp. 85. Price, $1.00. The author presents the results of an examination of the existing types of the North American species, which are widely scattered, largely in European herbaria. Numerous changes in nomenclature are naturally found necessary.

R. W. SHUFELDT. Observations upon the osteology of the North American Anseres. Proc. U. S. Natl. Mus. XI:215-251. Washington, 1889. From the author.

E. L. Greene. Pittonia Vol., 1, Part 6. March.May, 1889. The present number completes the first volume and contains an account of the vegitation of San Benito islands, off the Lower Californian coast, a treatment of some Californian Umbelliferae, descriprions of new species, and various botanical notes and discussions. Miss Mary Graham also contributes to this number her interesting "Reminiscences of Major John E. Le Conte."

NEW MEXICAN SPANISH ANTIQUITIES. *The Nation.* March 8.

COLONIZATION OF LOWER CALIFORNIA. *Science.* Apr. 5.

THE SAN FELIPE SINK, (California.) *Am. Meteorological Journal.* March.

D. MARIAGER. A Zuni Genesis. *Overland Monthly.* April.

W. CROSS. Denver Tertiary Formation. *Am. Jour. Sci.*, April.

F. A. FERNOW. Science and "Christian Science." *Pop. Sci. Mo.*, April.

T. F. T. DYER. Plants in Witchcraft. *Pop. Sci. Mo.*, April.

SENATOR STEWART. Reclaiming the Deserts of the West. *Forum.* April.

EMIN PASHA IN CENTRAL AFRICA. A collection of the White Pasha's letters and journals is issued by Dodd, Mead & Co., containing invaluable information gathered by him on his explorations. "On the geography of plants and animals"; and "On the state of civilization and politics" are the titles of two of the several headings under which the work is arranged. Two portraits of Emin Pasha, and a map are given.

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EDITORIAL.

Each year presents a startling record of terrible loss of life and property by the elements. But 1889 surpasses any previous year in the history of the English race. Early in the year came the news of disaster at Apia, where our American navy suffered so severely. The sympathy of the whole civilized world is now aroused by the fearful calamity at Johnstown, Pennsylvania, on May 31st. Ten thousand people hurled into eternity by the pitiless torrent escaping from the Conemaugh artificial lake, upon its dam giving way, and two thousand more roasted alive in the conflagration that succeeded the flood. Before this loss of life, the twenty-five millions of property destroyed is insignificant. The whole Conemaugh valley is a scene of desolation, not only Johnstown, but other towns and villages and farm houses along this beautiful river have been washed away with thousands of their inhabitants. It is impossible at this time to estimate the total loss of life and property sustained by this section of country.

Our contributors will please note that MSS. should reach us as early as the first of the month preceding publication to secure the earliest insertion. Reports of societies and scientific news may be sent later but should reach us as early as possible, that they may not loose in interest by delay. When possible, articles, especially if of a technical character should be prepared by a typewriter. Proofs are not read by the Editor but we have engaged careful and experienced readers for this service.

Europe, Asia and Africa has each contributed to the Editor's mail of late. As four months were consumed in transit by a letter from Asia, we shall not be burdened by correspondence from that quarter, but now that San Diego is likely to be soon in direct communication with China and Japan, through the Peninsula and Oriental Steamship line, we may hope that the SCIENTIST may become still better known in those countries.

Two or more new steamship lines are being inaugurated between San Diego and Mexican ports, which we hope may soon be in operation. The west coast to the south of us has been but little known to naturalists, and with these increased facilities for transportation, we may hope to learn more of its natural history in the near future. Numerous naturalists have already done what they could under existing difficulties, and each has found much of interest in every branch of science.

NOTES AND NEWS.

TATA-ALBUMEN is a variety of albumen, studied by Dr. Helbig which is transparent, even when boiled. It was first found in the egg of a certain species of sand marten. Later it was ascertained that by the action of soda or potash, ordinary egg albumen could

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be converted into tata-albumen, it thereby becoming doubled in bulk and glassy in appearance. It is eight or ten times more digestible, more stable, and allows the addition of any spice.

"The Land of the Midnight Sun" must indeed be an interesting portion of the earth's surface to visit if we may judge from the extremely interesting and beautifully illustrated article about that region that appears in *Demorest's Monthly Magazine for July.*

The sound of the axe and the hammer, not only on the assembly grounds, but all around the lake is responded to by the people near and far in notes of preparation for the season's great annual festival at Chautauqua. Fifteen years have passed since the opening of this summer school in the woods. Chautuaqua has ever refused to do any but thorough work, its power has become international, and it has bound friends by the thousand to itself. All the year round, through its literary circles and otherwise, its influence is felt not only in every state in the union but beyond the sea and the great gatherings of the summer are but the logical results of this vital under current.

The botanist of our U. S. Department of Agriculture is referred to by an English contemporary as *Sir* George Vasey. His descriptions of grasses adapted to arid districts are widely copied.

Lentils and tares are receiving considerable attention in South Australia, where they are cultivated for fodder.

Rabbits, sparrows, kangaroos, paddymelens, hares, foxes and kangaroo rats seem to be the more troublesome of the animals in Australia, on which the Government offers bounties.

A thick shower of small frogs is reported in the "Western district" by the *Victorian Farmers' Gazette*, of April 29th.

The rabbit diseases commission of New South Wales has reported unfavorably on M. Pasteur's proposal to extirpate rabbits by means of chicken cholera. The commission finds that the use of the microbes in the food does not cause the disease to spread rapidly from infected to healthy rabbits.

The latest maritime curiosity in British waters is a torpedo boat burning petroleum or tar refuse in place of coal. The vessel has made nineteen knots an hour without permitting any perceptible smoke, and is said to move quite noiselessly. She is 137 ft. in length and her crew numbers only seven men.

The wax-scale of Florida, (Ceroplastes floridensis) has been discovered in California, on trees imported this season from Florida, according to a note in *Insect Life.* It is not noted as a pest in Florida, but occasionally it will increase upon an individual tree so as to arouse apprehension.

Samuel Lowell Elliot died February 12, aged forty-five years. He was a careful student of the habits of insects and very suc-

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cessful in contriving methods for rearing and studying living insects.

Mr. T. S. Brandegee and Mrs. Mary K. Curran, both of San Francisco, surprised their friends by a quiet wedding on May 29th. They were married in San Diego by Rev. Dr. Noble. THE SCIENTIST offers them its heartiest congratulations.

Messrs. T. S. Brandegee and Walter Bryant returned in May from an extensive trip through Lower California. We failed to meet Mr. Bryant and so did not learn the extent of his success, but Mr. Brandegee reported the collection of about thirty species of cacti; and altogether nearly a thousand species of plants, while his field notes will give the most southerly stations for many of the Californian plants.

Prof. L. F. Ward, (Proc. U. S. Natl. Mus.), shows that the genus Platanus, of only seven existing species, was at its zenith in the Cretaceous and Tertiary periods.

Chlorogalum parvifolium is abundant on portions of the San Diego mesas, where it grows scarcely six inches high. We recently measured a specimen of this lily which we collected in a canyon among our foot hills—the loose, spreading panicle of flowers, of which, stood *seven feet high!* The bulbs are frequently as large as onions, and the height above recorded is not exceptional.

Frederick A. P. Barnard, President of Columbia College, died April 27th. He was born May 5th, 1809, at Sheffield. Mass. He ranked with the most advanced thinkers of the day, and did much to enhance the scientific standing of the United States. In microscopy and astronomy he did excellent work, and his labors were recognized by the conferring of honorary degrees from many universities.

The seeds of the alfilaria are gathered by the ants in Southern California, in considerable quantities, judging from the hulls which they pile around the openings to their nests.

The Century for June contains an interesting and instructive illustrated sketch of an "American Amateur Astronomer," Mr. Burnham, formerly of Chicago, now of the corps at the Lick Observatory.

Among the articles in *St. Nicholas*, for June that will interest young naturalists, is one by Anna Botsford Comstock, on "Hidden Homes." Prof. H. H. Ballard, President of the Agassiz Association, also contributes a suggestive paper on "Amateur Photography."

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Shells For Sale by C. R. Orcutt, San Diego, Calif.

Acmaea, Esch.
$ .15..depicta, Dall
.20..insessa, Hds
.05..mesoleuca, Mke
.15..paleacea
.05..pelta, Esch
.10..var. elevata, Orcutt
.05..testudinalis

Acus, Humphrey.
.50..aureola, Gray
.25..caerulescens, Lam
.25..crenulata, L
.20..denudata
.05..dislocatus, Say
.20..maculata, L
.20..strigillata, Gray
.20..subulata, Lam

Adeorbis, Wood.
.25..subcarinatus, Mont

Adula, H. & A. Adams
.20..falcata, Gld
.15..styliza, Cpr

Alexia, Leach.
.10..personata, Midd
.05..setifer, Cooper

Alvania.
.20..aequisculpta, Cpr

Amalthea, Schum.
.50..conica, Schum

Amiantis, Cpr.
1.00..callosa, Conr

Amnicola, Gld. & Hld.
.05..cincinnatiensis, Anth
.10..carbeniana, D'Orb
.05..decisa, Hld
.05..grana, Say
.05..integra, Say
.05..lapidaria, Say
.05..limosa, Say
.15..longinqua, Gld
.05..lustrica, Say
.10..pallida, Hld
.20..panamensis, Tryon
.05..parva, Lea
.05..porata, Say
.25..sp. indet, Utah

Amphibola, Schum.
.20..fragilis, L
.12..nux-avellana, Chem

Amphissa, H. & A. Ad.
.10..corrugata, Rve
.10..versicolor, Dall

Ampullaria, Lam.
.50..chiquitensis, D'Orb
1.00..cumingii, Sby
2.00..olivacea, Spix
.50..scalaris, D'Orb

Amycla, H. & A. Ad.
.05..carinata, Hds
.10..var. hindsii, Rve
.15..chrysalloides, Cp
.10..gausapata, Gld

Anachis, H. & A. Ad.
.10..coronata, Sby
.10..fluctuata, Sby
.10...guatamalensis, Sby
.10..penicillata, Cpr
.20..pygmaea, Sby
.20..rugosa, Sby
.20..rugulosa, Sby
.20..subturrita, Cpr
.20..varia, Sby

Ancillaria, Lam.
.50..accuminata, Lam
.15..ampla, Gmel
.20..candida, Lam
.20..cinnamomea, Lam
.15..fulva, Swains
.75..glabrata, Swains
2.00..montronzieri, Sby
.15..rubiginosa, Swains
.40..tankervillii, Sby
.40..torosa, Mensch
.20..vesicula, Gmel

Anapa, Gray.
.50..triquetra. Hawley

Anculosa, Say.
.10..ampla, Anthony
.05..plicata, Conr
.10..rubiginosa, Lea

Ancylus, Geoffroy.
.05..fluviatilis, Lam
.20..lacustris
.15..rivularis

Angitrema, Hald.
.50..angulata, Wetherby

Angulus, Schum.
.10..gouldii
.10..modestus
.10..obtusus, Cpr
.15..variegatus

Anodonta, Cuvier.
2.00..bridgesii, Lea
.50..californiensis, Lea
1.00..corpulenta, Cp
.50..cygnaea, L
1.00..var inflata
1.00..var. limpida
.50..edentula, Say
.75..ferrussaciana, Lea
.25..fluviatilis, Dillw
1.00..grandis
2.00..jewettii, Lea
.50..oregonensis, Lea
1.00..wahlamotensis, Lea

Anomia, L.
.20..aculeata, Gmel
.10..ephippium, L
.25..glabra Verrill
.25..lampe, Gray

Aporrhais, Dillw.
.25..occidentalis, Beck
.25..pes-pelecani, L

Asaphis.
.25..deflorata, L

Arca, L.
.20..americana
.15..incongrua
.30..mutabilis
.15..noae, L
.30..ponderosa Say
.30..solida, B & S
.30..tetragona
.30..virescens, Rve

Assiminia, Leach.
.10..californica, Tryon

Astarte, Sby.
.15..castanea, Sby
.25..conradi, Shuttl
.25..equimalti, Baird
.15..sulcata, Da Costa

Astyris, H. & A. Ad.
.10..aurantiaca, Dall
.10..chrysalloidea, Cpr
.10..tuberosa, Cpr
.10..variegata. Stearns

Atys, Montfort.
.20..cylindrica

Auricla, Lamarck.
.50..parva, Swainson
.50..auriculidae, L
.25..elongata, Parr
.05..fasciata, Desh
.25..solida, Swainson

Avicula, Lam.
.25..brevicauda, Desh
.20..hirundo, L
.20..margaritifera, Brug
.25..tarentina

Axinaea, Poli.
.50..maculata. Brod

Bankivia, Beck.
.10..varians, Beck

Barleeia, Clark.
.10..haliotiphila, Cpr

Bithynia, Gray
.15..leachii, Shep
.05..tentaculata, L

Bela, Gray.
.20..brachystomoides

Bittium
.05..filesum, Gld
.10..lawleyanum, Crosse
.05..nigrum, Tottem
.15..quadrifilatum, Cpr
.05..reticulatum, DC
.05..scabrum, Olu

Blauneria, Shuttl
1.00..pellucida, Pfr

Bryophila, Cpr
.15..setosa, Cpr

Buccinum, L
.25..glacialis
.20..undatum, Lam
.25..undulatum, Moll

Bulimnea, Hald
.25..megasoma

Bulinus, Adams
.10..hypnorum, L

Bulla
.20..Adamsi, Mke
.20..ampulla, L
.15..occidentalis, Adams
.20..solitaria, Say

Busycon, Bolten
.50..perversum, L

Caecum, Flem
.10..californicum Dall
.25..crebricinctum, Cpr

Calliostoma, Sun
.50..annulatum, Mart
.20..canaliculatum Mart
.15..costatum, Mart
.50..gemmulatum
.50..exiguus, Pult
.15..striatus, L
.50..tricolor

Callista, Poli
.25..gigantea, Chem
.25..maculata, L
.50..lupisearia. L

Callopoma. Gray
.50..fluctuosum, Gray
.50..fokkesii, Jones
.25..tessellatum, Reeve

Calyptraea, Lam
.25..conica, Brod
.10..chinensis, L
.50..dilleyani, Gast
.20..equestris
.20..striata

Cancellaria. Lam
.35..reticulata, I
.30..similaris, Sby

Canthurus, Bolten
.50..tinctus, Conr

Cardita, Brug
.25..affinis, Sby
.25..floridana, Conr
.15..sulcata, Lam

Cardium, L.
.50..aculeatum, L
2.00...blandum, Gld
.50...corbis, Mart
.10...consors, Brod
.20...islandicum
.50...isocardia, L
.75..magnum, Born
.25..muricatum
.15. mortoni, Conr
.40..norvegicum, Speng
1.00..paucicostatum, Sby
.25 ..serratum, L

Casmaria, H. & A. Ad.
.50...vibex, L

Cassidula, Ferrussac.
.50..crassiuscula

Cassis, Lamarck.
1.00..abbreviata, L
.75...eburneus, Brug
.50...undatum, Mart
.50...testiculus, L
1.00...tessellata

Ceratisolen, Forbes.
1.00...legumen, L

Cerithidea, Swains.
.20..ambigua, C B Ad
.10..californica, Nutt
.15...decollata, Lam
.10..icstoma, Pfr
.20...mazatlanica, Cpr
.25..montaguii, D'Orb
.25. obtusa, Lam
.15..ornata. Ads
.15..pulchra, C B Ad
.10...scalariformis, Say
.15...tenuis, Pfr
.25...varicosa, Sby
.15..mamillata, Risso

Cerithiopsis, F. & H.
.15..tuberculata, Mart
.15...tubercularis, Mart

Cerithium, Brug.
.20...carbonarium
.20...cchinatum, Lam
.05...ferrugineum, Say
.20..fasciatus, Wood
.10...fusciatum, Risso
.10..literatum, Born
.25...maculosum, Kien
.20...mamillatum, Risso
.10...morus, Lam
.10..muscarum, Say
.10..nigriscens, Mke
.40..nodulosum. Brug
.35...obeliscus, Brug
.25...polygonum, Sby
.20...reticulatum, DaCosta
.05...rupestre, Brug
.15..scabrum
.10...stercus-muscarum
.15..var
.05...septemstriatum, Say
.10..uncinatum, Gmel
.20..versicolor, C B Ad
.20...violaceum
.25...vulgatum, Brug

Chama, L.
.50..acnella, L
.22...arcinella, L
.25..exogyra, Conr
.25..macrophylla, Chemn
.20..spinosa
.00...sp indet Gulf Cal

Chemnitzia, D'Orb.
.25...castanea, Cpr
.25...stylina, Cpr
.25..tenuicula, Gld
.25..torquata

Chilina, Gray
1.00...fluctuosa, Gray
1.00...fluviatilis, Gray

Chione, Megerle
.25...californiensis, Brod
.20..cancellata, L
.50..dombei, Lam
.50..granulata, Gmel
.40...grata, Sby
.20...paphia, L

Chiton, L
.50..acuta, Cpr
.15..apiculatus, Say
.20..cinereus, L
.25..decoratus
.20...circulus
.20..gemmeri, Cpr
.25...lamuginosa, Cpr
1.00..tunicata, Sby
.50..hindsii, Gray
.30..mertensii
1.00..wassnessenskii, Midd
1.00...stelleri, Midd
.50...stokesii
.15..lineata, Wood
.30...rugatus
.70..lignosa, Gld
.40..merckii, Midd
1.00...acrior

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Chiton, L.—Cont.
.20..striatus
.35...piceus, Gmel
.50..cooperi
.35...palmulatus, Cpr
Chlorostoma, Swains
.10...ater, Lesson
.10...argyrostomus, Gmel
.15...aureotinctum, Fbs
.15...brunneum, Phil
.15..lineata, Da Costa
.20...pfeifferi, Phil
Chrysodomus, Swain
.15..dirus, Rve
1.00..kennicotti, Dall
Circe, Schumacher
.25...divaricatus, Lam
.50...gibba, Lam
.35..rivularis, Born
Clypidella, Swainson
1.00..bimaculata, Dall
1.00..callomarginata
Collonia, Gray
.15..granulosa, Pse
.25..vitiensis, Bar
Columbella, Lam
.10...carinata, Hds
.10..cribraria, Lam
.20..concinna, Sby
.20..duclosiana, Sby
..flava, Lam
.05..fulgurans, Lam
.10..fuscata, Sby
.10...gausapata
.10...hsemastoma, Sby
.15..lunatia, Sby
.20..lutea, Suoy
.20...maculosa, Sby
.20..major, Sby
.05..mercatoria, L
.10..nitiela, Lam
.20..obesa
.20..paytensis, Lesson
.05..rustica, L
.10..scripta, L
.15..scumpicata, Stearns
.20..strombiformis, Lam
.20..semiconvexa, Lam
.10..varians, Sby
.20..versicolor, Sby
.20..zebra, Gray
Cominella, Gray
.50..costata, Suoy
Concholepas, Lam
.25..peruviana, Lam
Conchelix, Swains
.50..conicus, Schum
Conus, L
.25..abbreviatus, Conr
.30..achatinus, Chemn
.75..amadis, Mart
1.00..ammiralis, L
.20..arachnoides, Gmel
1.25..araneosus, Hwass
.30..arena
.40..arenatus, Hwass
.50...archiepiscopus, Hw
.20...aristophanes, Ducl
1.25..augur, L
.10..auratius, Hwass
.30..australis, Lam
1.25..bandanus, Hwass
1.25..betulinus, L
.50..capitaneus, Hwass
.25..catus, Hwass
.35..cedonulli, Brug
.30..ceylonensis, Hwass
.35..cinereus, Hwass
1.00..cingulum, Mart
.20..concinnus, Brod
1.00..costatus, Chem
.30..daucus, Hwass
.30..distans, Hwass
.40..eburreus, Hwass
.75..figulinus, L
.50..flavidus, Brug
.25..floridensis, Gabb
.10..franciscanus, Hwass
.25..fuscatus, Born
1.00..gabrieli, Kr
.50..generalis, L
.60..geographus, L
.40..gladiator, Brod
.30..glans, Hwass
.20..granulatus, Hwass
.35...gubernator, Brug
.25..hebraeus, L
1.00..hyena, Brug
1.25..imperialis, L
.25..interruptus, Sby
.30..lacteus, Lam
.50..legnarius, Rve
.50..leoninus, Brug
.60..lineatus, Chem
1.00..literatus, L
.30..lithoglyphus, Mench
.50..livi us, Brug
1.50..maculatus, Sby
.25..mahogani, Sby
.50..marmoreus, L
.25..mediterraneus, Brug
1.00..mensomtaraon, Ch
.15..menotus, Brug
.35..mi'es, L
.25..miliaris, Hwass
1.00..millepunctatus, L
.25..minimus, L
.60..monile, Brug
.20..mus, Hwass
.25..musicus, Hwass
.20..nebulosus, L
.60..nussatella, Burg
.25..nux, Brod
.40..obesus, Brug
.40..omaria, Brug
.30..parius, Rve
.50..papilionaceus, Brug
1.00..pealli, Green
.25..planorbis, Born
1.00..princeps, L
1.00..promethens, Hwass
.25..proteus, Hwass
.25..pulicarius, L
.25..punctatus, Ch
.25..puncticulatus, Hwass
.50..purpurascens, Brod
.20..pusillus, L
.25..pusio, L
.60..quercinus, Hwass
.25..rattus, Brug
.25..regularis, Sby
.30...senator, L
.30..spectrum, L
.30..spouralis, Chemn
.50..spurius, Gmel
.30..stereus-muscarum, Ch
.40..stellatus, Rve
.40...stramineus, Lam
.75..striatus, L
.50..sulcatus, Hwass
.50..sumatrensis, Lam
.25..taeniatus, Br
.35..terebra, Br
.30..terminus, Sby
.40..tessellatus, Brug
.25...testudineus, L
.60..textile, L
1.00..tiaratus, Brod
.30..trigris, L
.15...tornatus, Br
.50..tulipa, L
.35..varius, Brug
.20..venulatus, Hwass
.30..vermiculatus, Brug
.25..verrucosus, Brug
1.25..vexillum, Mart
1.00..victoriae, Rve
.60..virgo, L
.35..vitellus, L
.25..vitulinus, Br
1.00..vulpinus, Brug
Cooperella, Carp
.25..scintillaeformis, Cpr
Coralliophila H & A Ad
.50...costulata, Bld
Corbicula, Megerle
.50..pusilla, Bourg
Corbula, Brug
.15..contracta, Say
.10..gibba, Olivet
.10..inoequicalois
.20..lineolata, Say
.15..nucleus, L
Crassatella, Lam
.20..marginata Cpr
Crenella, Brown
.10..glandula, Totten
.20..marmorata, Fbs
Crepidula, Lam
.05..aculeata, Gmel
.10..convexa, Say
.15..dorsata, var
.30..dilatata, Lam
.15...elongata
.15..excavata, Brod
.10..fornicata, Gmel
.10..marginalis, Brod
.20...onyx, Sby
.10..plana, Say
.10..unguiformis, Lam
Cruelbulum, Schum
.35..corrugatum, Brod
.20..trigonale, Ad & Rve
.15..quinquinum, Les
Cryptogramma, Meh
.20..impressa, Hanley
.25..macrodon, "
.25..squamosa, "
Cuma, Humphrey
25...coronatum, Lam
.25..imperialis, Lam
.25..kiosquiformis, Ducl
.25..sacellum, Lam
.25..tectum, Wood
Cumingia, Clessin
.15..tellinoides, Coast
Cyclas, Brug
.05..rivalis, Drap
.05...rivicola, Leach
.05...similis, Say
.05..stamines, Con
.05..transversa, Say
Cymba, Brod
1.00..neptuni, Gmel
.25..porcina Brod
1.00..proboscidialis, Lam
Cypraea, Linn
.15..abella, Lam
.20..achatina, Soland
.25..acicularis
.50..aduста
.10..albuginosa, Maw
.50..amathysta, L
.25..annulus, L
.20...annulata, Gray
.40...approximans
.50...arabica, L
.25..arenosa, Gray
.75..argus, L
.40..arenaria
.40..armadina
.10..asellus, L
..angustata, Gmel
.50..aurantium, Mart
.25..arabicula, Lam
.50..atomari, Gmel
1.00..australis, Gray
1.00..bartheleysii, Gmel
1.00..bicalloss, Grey
1.00..bicolor, Gask
.50..boivini, Kien
.15..caput-serpentus, L
.75..carneola, Mart
.25..caurica, L
.50..cervus, L
.15..cinerea, Gmel
.20..clandestina, L
.40..cruentata, Gmel
1.00..cervinetta, Kien
.25..cruenta, L
.25..cicercula, L
.35..cribraria, Lam
.50..chrysoscoma, Kien
.15..citrina, Gray
.50..clara, Gask
.40..coffea, Gray
.50..concava, Gray
.25..childreni, Gross
.25..contamina, Gray
.30..controversa, Gray
.20..candidula
.2 ..costata
.50..capensis, Gray
.25..cervici, Sby
.40..comptonii, Gray
1.00..cribellum, Gask
.20..cylindrica, Born
.75...cumingii
.50..dubia, Gmel
.35..eburnes, Bar
.25..edentula, Sby
1.00..eglantina
.15..erosa, L
.25..erronea, L
.10..europea, Mont
1.00..exanthema, L
.50..fasciata, Chem
.50..felina, Gmel
.50..flaveola, Lam,
.50..fimbriata, Gmel
.50..zigilis, L
.50..zusca
1.00..gangrenosa, Dill
1.00..gemmula, Mof
1.00...gooda li, Gray
.75..gracilis, Gask
.75..guttata, Gray
.40..globosa, Kien
.15..helvola, L
.35..histrio, Kien
.25..hirundo, L
.30..isabella, L
.25..insecta
.30..interrupta, Gray
.20..irrorata, Gray
.50..intermedia
.50..irina
.35 ..amarckii, Gray
1.00..lurida, L
.25..lynx, L
.15..limacina, Lam
.50..lentiginosa, Gray
.50..lutea, Gmel
.50..listerii, Gray
1.00..lathynis
.50..madagascariensis, Gm
1.00..mauritiana, L
1.00..mappa, L
.50. mus, L
.20..moneta, L
1.00..maculata, Barnes
1.00..momitiaris, Lam
.40...miliaris, Lam
1.00..menkiana, Desh
2.00..modesta
1.50..moosa, Brod
1.00..maugeriae
1.00...macula, A. Ad
1.50..microdon, Gray
2.00...mappa, var rosea
.25..neglecta, Sby
.20..nucleus, L
.30..nigropunctata
.50..nymphii
.25..nivea, Gray
.20..nivosa, Sby
.50..onyx, L
.25..occelata, L
.20..obvellata, L
.20..obesa
1.00..oniscus
.50..oryza
.10..pulex
1.00..princeps
1.00..physis, Brocchi
.40..pallida, Grey
1.00..pustulata, L
.50...pantherina, Grey
.30..picta, Gray
.15..poraria, L
1.00..punctulata, Gray
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.50..punctata, L
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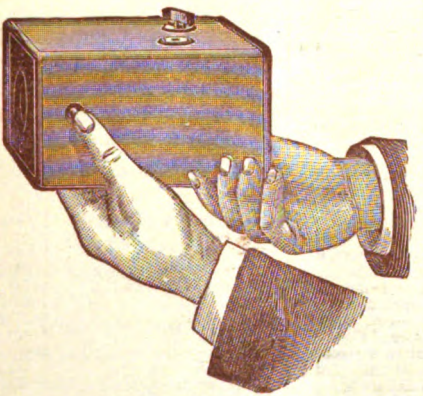

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Corbicula, Magerle
.50..pusilla, Bourg
Corbula, Brug
.15..contracta, Say
.10. gibba, Olicot

.25..cruenta, L
.25..cicercula, L
.35..cribraria, Lam
.50..chrysoscoma, Kien
.15..citrina, Gray
.50..clara, Gask
.40..coffea, Gray
.50..concava, Gray
.25..childreni, Gross
.25..contamina, Gray
.30..controversa, Gray

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Official Organ of the San Diego Society of Natural History.

C. R. ORCUTT, - - EDITOR.

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The Botanical parts, 25 in number, thus far issued are as follows:

Vol. I, pp., 1-619 and title-page, plates i-xxxv.

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Vol. IV, pp. 1-410, plate cx.

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VOL VI OCTOBER, 1889. No. 48.

THE MEALY BUGS OF THE UNITED STATES.

The mealy bugs derive their name from the white, mealy powder with which their bodies are covered. They are furnished with six legs and two antennæ; the adult male is provided with a single pair of wings, but the female never acquires these organs. The following tables will aid in determining the different species known to occur in this country. Adonidum longifilis, and the male of citri are unknown to me, and their places in the following tables are assigned to them in accordance with the excellent descriptions of these species given by Prof. Comstock in the Report of the U. S. Dept. of Agriculture for the year 1880. The male of Ryani is at present unknown.

FEMALES.

1.—Joint 6 of antennæ longer than 3; the two anal appendages as long as the entire body.....adonidum, Linn.
Joint 6 of antennæ shorter than 3.....2.
2.—Seventh antennal joint much shorter than the second..3.
Seventh antennal joint as long as the second; anal appendages never one-half as long as the body; eggs deposited in a cottony mass..... citri, Boisd.
3.—Anal appendages as long as the entire body
.....longifilis, Com.
Anal appendages never as long as the body.....4.
4.—Body thickly covered with mealy matter, first antennal joint shorter than the fifth; young brought forth alive; no cottony egg-mass.....Crawii, n. sp.
Body nearly naked, first antennal joint longer than the fifth; eggs laid in a cottony mass.....Ryani, n. sp.

MALES.

1.—Joint 6 of antennæ shorter than 10.....2
Joint 6 longer than 10.. 3
2.—Antennal joint 8 longer than 7.....adonidum, Linn.
Antennal joint 7 as long as 8.....citri, Boisd.
3.—Expanse of wings 7 mm. (over one-fourth of an inch)
.....Crawii, n. sp
Expanse of wings 2.6 mm. (about one-tenth of an inch)
.....longifilis, Com.

THE ORANGE MEALY-BUG (Dactylopius citri, Boisduval; Synonyms: D. destructor, Comstock, Coccus phyllococcus,

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Ashmead). This species is sometimes very destructive to orange trees in the Southern States, and also in the south of Europe. It is the only described species known to me to occur on the Pacific Coast, where it also infests orange trees.

THE CYPRESS MEALY-BUG (Dactylopius Ryani, n. sp.). Adult female rounded-oval, or ellipsoidal, posterior end of abdomen convex; dull salmon-brown, legs and antennæ lighter; very sparsely covered with a white, mealy powder not concealing the ground color; white cottony appendages along sides of body very short; the two at the posterior end never more than one-third as long as the body; antennal joints 2, 3 and 8 sub-equal in length, longer than any of the others, the eighth twice as long as the seventh; joint 1 is next in length and is much thicker than either of the others; then 4, 5 and 7 sub-equal in length, joint 6 being the shortest, scarcely one-third as long as the eighth; tubercle of proboscis one-half as long as the tibia, situated slightly in advance of a line drawn between the front coxæ; tarsi one-third as long as tibiæ, no tooth on underside of the claw, upper and lower digitules knobbed at the tip; length of body nearly 3 mm. (about one-eighth of an inch).

Recently hatched female larva elongate-ellipsoidal, posterior end of abdomen truncated and bearing two quite long white cottony appendages between which is a pointed projection; body pale yellow, tip of proboscis-tubercle purplish; antennæ six-jointed, but the first four joints not well defined, the sixth about as long as the first three taken together.

Egg elongate-ellipsoidal, minutely granulated; pale yellow. The eggs are deposited in a mass of loose white cottony matter which is sometimes twice as long as the body of the female.

Named in honor of its discoverer, Mr. F. G. Ryan, of Anaheim, Cal., who reports finding it on Monterey cypress (Cupressus macrocarpa), Chinese arbor-vitæ (Thuja orientalis), and on Norfolk Island pine (Araucaria excelsa). Later I received specimens from Col. F. H. Keith, of the same place. This is the only species of mealy-bug known to me to infest Conifers.

THE SAGE MEALY-BUG (Dactylopius Crawii, n. sp.). Female elongate-ellipsoidal, posterior end of abdomen slighty concave; wholly light yellow; above thickly covered with a white, mealy powder, the margins furnished with about thirty-four white cottony appendages, the two at posterior end of body the longest, about equalling one-third length of body; antennal joints 2, 3 and 8 sub-equal in length and longer than any of the others, the eighth twice as long as the seventh; the fifth is next in length, then the fourth and seventh, the sixth and the first being the shortest, but the difference in length between them and the fourth and seventh is slight; tubercle of proboscis and the tarsi as in Ryani; length of body 4 mm. (about one-sixth of an inch).

The female brings forth her young alive, and simply secretes a layer of white cottony matter, on which she rests.

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Male larva, fully grown, same as the adult female above described, except that the legs and antennæ (excepting apices of joints 3 to 7) are dark brown, and there is a large brown spot on the breast in front of a line drawn between the front coxæ, and a smaller brown spot behind a line drawn between the middle coxæ; antennal joints 3 and 8 the longest, each nearly twice as long as the second; joint 4 next in length, then 5, then 6 and 7 subequal, then 1 and 2 the shortest; tarsi one-half as long as the tibiæ the claws with a distinct tooth slightly beyond the middle; length of body 3¼ mm.

The cocoon of the male is elongate-ellipsoidal, of a uniform close texture, and pure white; it measures 4 mm. long by 1¼ mm. in diameter.

Adult male blackish-brown, abdomen lighter towards the tip, covered with a mealy substance; antennal joints 3 to 9 becoming successively shorter, the ninth being about four-fifths as long as the tenth, the latter much constricted at its first fourth; joint 1 nearly one-third as long as 10. joint 2 the shortest, being as wide as long; joints 1 and 2 more robust than the others; joints 3 to 9 much constricted at their tips, each with a large swelling at the base and with three or four smaller swellings, the apical one but slightly smaller than the one at the base, each bearing long bristles somewhat arranged in whorls; thorax three-fourths as long as the abdomen; wings smoky-gray; the two veins black except their bases, which are yellowish, and there is a dark brown fold on either side of each vein; poisers furnished at tip with four hooked bristles; tarsal claw much swollen below, the swelling bearing two short spines on its apex, and in front of these are the knobbed digitules; upperdigitules not knobbed; length of body 3 to 3½ mm., of anal appendages 7 mm., expanse of wings 7 mm.

I found this species in large numbers near Los Angeles, on the leaves of wild sage (Audibertia polystachya) as kindly determined for me by the editor, Mr. C. R. Orcutt, to whom I am indebted for many similar favors.

The males issued early in May from larvæ found on the 14th of March, the larvæ, as in the other species, secreting a white cottony cocoon in which to pass their transformations.

I take great pleasure in dedicating this fine species in honor of my friend, Mr. Alexander Craw, of this city, who has aided me much in my entomological studies. *D. W. Coquillett.*

Los Angeles, Cal.

NOTES FROM THE SAN DIEGO BIOLOGICAL LABORATORY.

THE FISHES OF CORTEZ BANKS.

By C. H. and R. S. Eigenmann.

During the winter of 1889 the U. S. Fish Commission Steamer Albatross conducted investigations about San Diego. Part of

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the work consisted in exploring the Cortez Banks. The results of this exploration have not yet been published. The older charts show them to be situated about a hundred miles from San Diego. The shoalest water is on Bishop Rock, two and one-half fathoms. In some unaccountable way the rumor was spread that the Albatross had discovered a Cod Bank. This rumor was scarcely dispelled after Lieutenant Tanner's published enumeration of the food fishes of the Cortez Banks, and the statement that no cod-fish were found there. One of the outcomes of the rumors thus set afloat was the establishment of the Pacific Ocean Fish and Canning Company, whose immediate object is the exploration of the economic value of the Cortez Banks. Through the courtesy of Mr. D. Schuyler, I was enabled to accompany the company's schooner Azalene on one of her exploring trips. Although the expedition was highly satisfactory from an economic standpoint, the scientific results were more so. Twenty species have been added to the fauna of the San Diego region; eight species of these are new; eight have been known from the north only; several from north of Point Conception; three are from the south, and one from the open sea.

The following list of the species obtained may prove of interest: Those new to the locality are marked with an asterisk. Some of these have been noticed by us in the San Diego markets the past winter.

1. *SQUALUS ACANTHIAS L.—A school of this species was encountered in forty-five fathoms. About a dozen were captured. Some of them contained eggs nearly ready to be deposited. This species is at once recognized by its teeth and by its white spots.

2. *CARCARHINUS GLAUCUS(L.)—One specimen from forty-five fathoms.

3. STOLEPHORUS DELICATISSIMUS (Girard.)—One specimen from the stomach of an albicore near the banks; several others from velellas.

4. *MYCTOPHUM CALIFORNIENSE sp. nov.—Several specimens from forty-five fathoms. .095 m. This species is evidently very closely related to M. boops (Richardson),from Vancouver's Island. The chief point in which our specimens differ from the descriptions of boops is the length of the pectorals. The position of the adipose fin differs also from the figure in Günther's "Study of Fishes" and the tail is much slenderer.

D. 14; A. 21; lat. l. 42; depth 5; head 3¾.

Body compressed-elongate, deepest above the pectorals; dorsal and ventral outlines equally arched. Caudal peduncle long, slender, its depth about 3 in the greatest depth. Head short and deep, its depth about 1½ in its length. Eye very large, with over-arching supraorbitals and raised postorbitals; nasal ridge ¾ the length of the eye. Eye 3 in head, ¾ in interorbital. Preopercular margin but little oblique, opercle and sub-opercle

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with a rounded margin. Maxillary considerably dilated behind, about 1½ to 1⅔ in head.

Scales entire.

Origin of dorsal fin much nearer tip of snout than to origin of caudal; base of dorsal 2½ in distance from base of middle caudal rays to last dorsal ray. Adipose fin equidistant from caudal and dorsal. Ventrals about reaching vent; pectorals not to second third of ventrals.

Phosphorescent spots placed as follows: One on each ramus of the mandible below the anterior margin of the eye; two on each side of the gill membrane, the first below the posterior margin of the pupil, the second below the end of the maxillary; one just behind the margin of the pre-opercle near the maxillary; another between the opercle and sub-opercle just behind the pre-opercle; five pairs on breast, four pairs between ventrals and anal; eleven pairs along the anal; four or five pairs along the caudal peduncle; two pairs on caudal peduncle behind the first accessory ray of the caudal; one just below the twenty-seventh scale of the lateral line, another just below the eighteenth scale; one midway between the latter and the last of the abdominal pairs; one about midway between the lateral line and second pair of the abdominal series, another similarly placed above the ventrals, one on lower margin of base of pectoral; one just above the second of the breast pairs, and another above this near the lateral line; the three last forming an isosceles triangle. Caudal peduncle superiorly with six large phosphorescent spots which in our specimens appear as white fatty spots. Black, the sides lighter, with numerous black dots. All the scales which are present and the head strongly coerulescent or steel blue. Pectoral smutty at base; dorsal, ventrals and anal white. Caudal white, with black cross lines.

5. *MYCTOPHUM TOWNSENDI sp. nov. Several specimens, the longest .09 m. from forty-five fathoms. These specimens were collected with those of M. californiense.

D. 13-14; A. 14-15; lat. l. about 35; depth 4½-5; head 3-3½.

Similar in form to M. californiense, the head longer, the caudal peduncle deeper, the eye infringing less on the profile. Depth of caudal peduncle little more than two in the greatest depth.

Head long, its depth about one and two-thirds in its length. Eye large, with broader supraorbitals than in californiense. Nasal ridge long and very high. Eye 3⅓ in head, interorbital somewhat wider than an orbital diameter, opercles as in californiense; maxillary not dilated behind, 1½ in head.

Origin of dorsal about equidistant from tip of snout and first caudal fulcrum; base of dorsal somewhat more than two in the distance from middle caudal rays to last dorsal ray. Highest dorsal ray about two in head. Ventrals reaching vent. Pectorals narrow, reaching origin of anal.

Several recurved spines on caudal peduncle above and below. Phosphorescent spots of the head as in californiense, the spots in

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the ventral series fewer in number; five pairs on breast; four pairs between ventrals and anal; six pairs along base of anal; six pairs along caudal peduncle; two pairs on caudal peduncle above the spines. Spots of the sides as in californiense with an additional spot on base of middle caudal rays, and another between the last of the anal pairs and the one below the twenty-fourth(?) scale of the lateral line.

Ventral surface of the caudal peduncle white; a similar light area along the base of the anal fin and another on middle of belly. A V-shaped spot in front of the anal in one specimen.

Color chiefly black; cheeks, opercles and scales metallic blue; mandibles barred with light, base of caudal black, the rest of the caudal fin and the other vertical fins light with black lines; ventrals and anal light, spotted with black.

We dedicate this species to Mr. Charles H. Townsend, Naturalist of the U. S. Fish Commission Steamer Albatross.

NOTOSCOPELLUS or gen. nov.

Pectorals much smaller than the ventrals, placed low, their upper margin scarcely above the ventrals. Eye comparatively small; dorsal longer than the anal, the anterior rays elevated.

6. * ? BRACHYCHIER sp. nov.—

Types three specimens from forty-five fathoms. .09 m.

D. 20-23; A. 18-20; depth 4¾ head 3⅓; lat. l. about 40.

Elongate, compressed; dorsal and ventral outlines equally arched. Head long, slender, the snout pointed, the profile only moderately rounded. Preopercle extending very obliquely backward and downward, its margin parallel with that of the opercle. Sub-opercle extending back beyond base of pectoral. Mouth large, maxillary not dilated posteriorly,one and two-fifths in the head.

Eye four in head, about one in interorbital. Iris black.

Dorsal falcate, the highest ray one and two-fifths in head; highest anal ray two in head. Origin of dorsal equidistant from tip of snout and end of anal, end of dorsal equidistant from its origin and base of middle caudal rays. Ventrals not reaching to vent. Pectorals minute: not nearly reaching ventrals.

A large elongate white spot on the dorsal surface of the caudal peduncle. Chiefly black, fins dark with lighter bars; base of caudal black.

7 EXOCŒTUS CALIFORNICUS Cooper.—Several seen flying over the banks.

8. *XIPHIAS GLADIUS L. Sword fish. One individual seen.

9. SCOMBER COLIAS Gmelin. Mackerel. Several schools seen between San Diego and the banks.

10. SCOMBEROMORUS MACULATUS (Mitchill.) Spanish Mackerel. Several seen.

11. SARDA CHILENSIS (Cuv. and Val.) Several schools seen.

12. *ORCYNUS ALALONGA (Gmelin.) Albicore. Surface fish; a number captured.

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13. TRACHURUS PICTURATUS (Bowdich.) Large specimens of this species were taken from the stomachs of Sebastichthys miniatus.

14. SERIOLA DORSALIS (Gill). Yellow tail. A number procured at one locality in fifteen fathoms.

15. SERRANUS CLATHRATUS (Girard.) On sandy bottom near San Clemente Island.

16. STEREOLEPIS GIGAS Ayres. Two individuals of about 300 pounds each, one at a depth of fifteen fathoms, the other of twenty-three fathoms. These fishes are always found in company with the "white fish" on which they feed.

17. GIRELLA NIGRICANS (Ayres.) Occasionally found in from fifteen to twenty-five fathoms.

18. *DITREMA ORTHONOTUS sp. nov.—A single specimen much digested. .18 m. to base of caudal; forty-five fathoms.

We judge this species to belong to the genus Ditrema from its single series of conical teeth and the size of the scales preserved above the anal fin. An absolute identification cannot be made from this specimen.

This species seems to differ in the straightness of its back from all others of the family known.

D. X, 22; A. III, 29; head 4; depth above origin of anal about three in the length.

Greatly compressed, dorsal outline almost straight from tip of snout to caudal; ventral outline greatly arched.

Mouth small, very oblique, on an angle of 45°; maxillary not reaching front of orbit. Teeth $\frac{6}{4}$; those of the upper jaw truly conical, those of the lower jaw truncate. Eye large, 3 in head, placed in the middle third; interorbital little convex. Gill rakers about 4 in the eye. Highest dorsal spine 2 in the head, the highest ray but little longer. Caudal deeply forked. Anal spines graduated, the third 1½ in eye. Ventrals? Pectorals reaching to near vent.

A large area above anal silvery; color elsewhere obliterated. This species is closely related to and may be identical with D. atripes J. and G. It differs from it especially in the slightly convex interorbital and the higher premaxillary.

19. TROCHOCOPUS PULCHER (Ayres.) Fat head.—This is one of the most abundant of the food fishes. It is always found in shallow water and on rocky bottom.

20. PSEUDOJULIS MODESTUS (Girard,) Señorita. Ranging from the surface to forty-five fathoms. Several from the stomachs of rock fish.

21. CAULOLATILUS PRINCEPS (Jenyns) White fish. Important food fish. This species goes in schools, though single individuals are occasionally caught. Some of the specimens with empty ovaries, others with ripe eggs.

22. *SEBASTODES PAUCISPINIS (Ayers.) This is one of the most abundant of the rock fishes, and on account of its large size is an important food fish. As is the case with the other

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species of this family, the younger forms are found in shallower water. The largest were found in forty-five fathoms. the smaller in fifteen fathoms.

The old frequently have large black blotches irregularly placed. The lateral line is usually light, this light area being bordered by two series of dark spots. The sides are salmon colored, some individuals being profusely spotted with dark. The young are more uniform in color.

23. SEBASTICHTHYS FLAVIDUS Ayres. Found with the preceding species. This species does not attain a large size, the largest not weighing over two pounds. It resembles Serranus clathratus,the sand bass,in shape and color and can readily be distinguished from the other rock fishes by its yellowish fins. The sides are gray, darker above. A series of large, light blotches, along the back. These are sometimes quite white.

24. *SEBASTICHTHYS MELANOPS (Girard.) A small species not very abundant; in shallow water. Oval in shape; side slate-colored with darker markings; belly white. D. XIII, 15½; A. III, 8½ or 9½. Jelly fish found in the stomach.

25. *SEBASTICHTHYS OVALIS (Ayres.) Abundant in deep water. (48 fathoms.) This is the deepest and thinnest of the rock cods. Sides and fins with many small black dots. The young of this species was frequently found in the stomachs of other more strongly armed species of this genus. Its color is quite different from that of the adult. A specimen .19 m. long, is yellowish gray, white below, darker above. A dark ashy spot on lateral line below sixth dorsal spine; another just below the lateral line below the tenth dorsal spine; a larger one above the lateral line below posterior part of soft dorsal; another on caudal peduncle just behind the dorsal. Dorsal fins colored like the dark spots, caudal like the body. Pectorals, ventrals and tip of anal pink; base of anal yellowish. Three dark lines radiating from eye. A dark line on maxillaries. A silvery spot on opercle. Iris pearl colored. D. XIII, 14½; A. III, 7½.

26. SEBASTICHTHYS MINIATUS Jordan & Gilbert. The most abundant species. 35 to 50 fathoms. Feeds on other fishes, chiefly other species of Sebastichthys.

Back and upper parts of sides bright lemon yellow, with numerous dark spots, which, in the smaller individuals are united to form mottlings or vermiculations. Lateral line deep red; lower part of sides and belly light red; all the fins deep red,the color of the back sometimes encroaching on the dorsal fins. Sides of head deep red, three yellow lines radiating from eye. D. XIII, 14½; A. III, 7½.

27. *SEBASTICHTHYS RUBER (Ayres.) Not very abundant. All the individuals caught were of a large size and found in deep water. One female with young—probably several million.

This species can best be distinguished by the rough ridges on the head. Rosy above becoming lemon yellow on belly; fins all dark brick-red, narrowly edged with black.

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28. *SEBASTICHTHYS LEVIS sp. nov. Type one specimen .67 m.

D. XIII, 13½; A. III, 7½; lat. l. 50; head 2¾; depth 3.

Head very large, pointed; its upper and lower outlines equally inclined. Mouth large, lower jaw projecting and entering the profile; a well developed symphyseal knob. Maxillary reaching to below posterior margin of pupil, greatly dilated behind, its width about equal to the diameter of the eye. Eye 1⅔ in snout, 5½ in head, 1 in interorbital which is very slightly convex.

Cranial ridges low and smooth, each one ending in a sharp spine. Preocular, supraocular, postocular, tympanic and occipital spines present. Occipital ridges diverging backward, longer than eye. Suborbital stay weak; opercular spines strong, pointed.

Gill rakers all short, about twice as high as wide. Scales of the head all cycloid, each scale with numerous small accessory scales. Mandible, maxillary and tip of snout naked, preorbital with scattered patches of scales; scales of the body weakly ctenoid.

Highest dorsal spine little less than half length of head, the membranes very deeply incised, those of the first three spines meeting the succeeding ones on their basal fifth, the incisions becoming gradually shallower backward, the tenth membrane meeting the eleventh spine on its upper third. Dorsal rays considerbly lower than the highest spine. Caudal emarginate. Second anal spine greatly thickened, 4½ in head. Ventrals about two in the head. Pectorals 1⅓. Peritoneum white.

Pink, with four interrupted cross bars of black, the first below origin of dorsal, second below sixth dorsal spine, third below tenth spine, fourth below seventh dorsal ray. Back sometimes dusky. One specimen has a large black blotch on anterior part of soft dorsal.

This is one of the largest of the rock cods. It was occasionally brought into the San Diego markets during the winter, but for lack of sufficient material for comparison we did not venture to publish a description at the time. It is moderately abundant in deep water and can always be readily distinguished by the color, the shape of the head and the deeply incised dorsal. Those caught would average about eight pounds each.

29. SEBASTICHTHYS CONSTELLATUS Jordan and Gilbert. Next to miniatus the most abundant species, averging much less in size; 25 to 50 fathoms. Orange colored. the back usually with olive green markings, sometimes colored like the sides. Sides and back with many white or pale blue dots. A rose colored spot under the fourth dorsal spine, another under the eighth dorsal spine; one under last dorsal spine, another under end of soft dorsal.

30. *SEBASTICHTHYS ROSACEUS (Girard.) A small species not rare. 20 to 40 fathoms. Sides brightest orange red, interspersed below with white. Four lightspots on sides surrounded by purple. Back with many purple markings; sometimes the

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orange, sometimes the purple predominates on the back and on head. All the fin rays purple, the membranes greenish yellow. Jaws purple.

31. *SEBASTICHSHYS CHLOROSTICTUS Jordan and Gilbert. Very abundant with S. miniatus, somewhat larger than S. constellatus. Upper parts of sides with many olive green spots.

32. *SEBASTICHTHYS ELONGATUS (Ayres.) Rather rare; in deep water. White overlaid with rosy; sides with three irregula horizontal bands of olive green, the lower two united posteriorly.

33. *SEBASTICHTHYS RUBROVINCTUS Jordan and Gilbert. Rare; two specimens from 35 fathoms. One of the brightest of the rock cods. Silvery tinged with rose color, sides with five bright scarlet cross bands.

34. SEBASTICHTHYS CARNATUS Jordan and Gilbert. Rather common in twenty fathoms. Large specimens of Otophidium taylori were found in the stomach which is not protruded as in the other species.

Back yellowish green, a flesh colored spot between second and third dorsal spines, extending upon the back but not meeting a band of similar color extending along the posterior part of lateral line. Sides flesh colored, sometimes with scattered scales of black. Interorbital colored like the back, the region between it and the dorsal fin flesh colored. a dusky line dividing this region into a narrower anterior and broader posterior part. Two dark bands extending back from eye, another below the eye from snout to opercle. Spines of the head not raised above the surrounding parts. D. XIII, 12½; A. III, 6½.

About a dozen much darker individuals of this species were caught, all of them with one or another fin mutilated. They were at first supposed to be S. chrysomelas, but no specimens were preserved as it was hoped that a whole specimen might be found.

35. *SEBASTICHTHYS CHRYSOMELAS PURPUREUS var. nov. Two specimens. This seems to us to be a variety distinct from chrysomelas. A large number of both this variety and of chrysomelas were brought into San Diego market, August 16th.

The supraocular spines are raised much above the surrounding parts. Dorsal in one specimen XIII, 13½, in the other XIV, 12½. Membranes of all the fins dark greenish tipped with purple. Base of anal yellow. Head and back dark brown; lower portions of sides purple; base of pectoral and its upper half brown tinged with yellow. A purple bar extending from eye downward and backward to subopercle, below which is a greenish band. Gill membranes and membranes below maxillary, the breast and belly dirty yellow. Mandibles purple, the lower lip yellow, the upper slate-blue. Membranes between third and fourth and seventh and eighth dorsal spines purple, the color extending on the back; a similar spot on and below last dorsal spine; sides irregularly blotched with purple, this color not forming a band along the posterior part of the lateral line.

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36. SEBASTICHTHYS SERRICEPS Jordan and Gilbert. Several specimens from 15 to 25 fathoms. The ground color of the back varies from almost black to very light lavender. The back and the fins of the lighter specimens with many dark spots; the usual black cross bands.

37. SCORPAENA GUTTATA Girard. One specimen.

38. *ICELINUS AUSTRALIS sp. nov. Types two specimens .04 and .05 m. to base of caudal. 45 fathoms. These specimens were taken from the stomach of Sebastichthys miniatus and are partly digested. The anal and dorsal fins have all disappeared. The dentition and armature of the head indicate that this species is closely related to I. quadriseriatus, of which it is possibly the young. Its relationship to Chitonotus cannot be made out as we have no specimens of that genus for comparison.

Body rounded in transverse section, scarcely compressed in the abdominal region, tapering from the shoulders to the slender tail. Mouth large, the maxillaries reaching beyond pupil. Occiput without ridges or spines. Interocular space slightly grooved, very narrow, its width about one-fourth the diameter of the pupil. Profile straight, upper preopercular spine rather short, simply dilated at the extremity or with a single upward directed spine near its tip, three simple spines below it.

Belly and an interrupted band along the sides white; a series of blackish spots or interrupted band along the sides. Head about three in the length; depth about seven; maxillary two in length of head; eye about three.

PARICELINUS gen. nov., Cottidae.

Type Paricelinus hopliticus sp nov.

V. I. 5. Spinous dorsal well developed; gills 3½, no slit behind the last; vomer and palate with teeth. Gill membranes (probably) forming a fold across the isthmus. Sides covered with stiff villiform prickles. A series of large plates each ending in a large recurved spine along the bases of the dorsals. Head well armed, the occiput, preopercle, suborbital stay, preorbital, and part of the supraorbital with spines. Nasal spines present; chin with two barbels. Br. 6. Soft dorsal and anal long. This genus is related to Icelinus, but differs in the number of ventral rays, armature, etc.

39. *PARICELINUS HOPLITICUS sp. nov. Type, a single well preserved specimen .15 m.; from the stomach of Sebastichthys levis from 48 fathoms.

D. XII-19; A. 23. Head 4, depth 6½.

Elongate, subcylindrical forward, somewhat compressed behind; region between dorsal armature flat.

Snout pointed. Eye large, elevated, 1 in snout, 3½ in head. Interorbital region with a deep median groove and two shallower grooves, its width less than diameter of pupil. Upper posterior portion of orbit strongly serrate. Posterior margin of preorbital serrate. Suborbital stay with two strong upward directed spines behind the eye. Top of head depressed, a series of

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three spines on either side, the posterior two removed from the anterior one. Two small spines above posterior part of each eye. Mouth large, maxillary reaching to below anterior margin of pupil, 3½ in head. Both jaws with bands of teeth, the outer anterior ones recurved. Vomer and palatines with smaller teeth. A barbel on either side of the lower jaw about as long as the pupil.

Origin of spinous dorsal above the posterior portion of the opercle, its end above the origin of the anal. Caudal broad rounded. Ventrals reaching to second anal ray. Pectoral very broad, reaching the fifth anal ray. A narrow stripe along base of anal naked; head?. Prickles along the lateral line enlarged, forming two series of spinelets along its anterior portion; 34 pairs of strong recurved spines along the sides of the back.

Sides ashy with scattered rusty spots; a series of conspicuous purple spots below the lateral line; lower surface white; dorsal and caudal marked with rusty bars.

40. *BRACHIOPSIS sp. ? Fragments of the tail from stomach of some rock cod.

41. PORICHTHYS MARGARITATUS (Richardson.) A number taken from the stomachs of rock cod.

42. OTOPHIDIUM TAYLORI (Girard.) Many small specimens from stomachs of various rock cods; two large ones from stomachs of S. carnatus.

43. PARALICHTHYS CALIFORNICUS (Ayres.) One small specimen much digested.

44. ? One specimen, all but the caudal digested beyond recognition, the caudal well preserved, black, a white spot near its middle, its margin white.

FLORA OF THE ALAMO.

I write these notes on the back of my horse while it slowlyfol - lows the well beaten trail to Alamo and Mexican Gulch, Baja California. A landscape gardner might here gather a few ideas by noting the contrasts and shades of coloring presented in the foliage of the native vegetation.

The light pea green of the finely divided even foliage of the deer brush (Adenostoma sparsifolium) forms a strong contrast with its congener, A. fasciculatum, which is clothed in a dark, olive green. Both are evergreens. Each groups itself separately and naturally, and covers large areas of contiguous land, and are as characteristic of the country and as beautiful as the heaths of the old world, which they somewhat resemble.

Only recently the deer brush, so called because deer are said to be fond of browsing on its tender branches, was covered with a multitude of delicate sprays of pure white flowers, now turned to a light chocolate brown in its fruiting state.

The shaggy bark is of a cherry red color, which adds consid-

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erably to its beauty. The young bushes are exceedingly ornamental, and once known would be greatly prized for cultivation.

The broad valley which I have just passed through was overgrown with emerald green grass, closely cropped by a multitude of horses, mules and burros in passing to and fro from the mines. In earlier spring it must have been a lovely spot, as seen from the top of the hill, with the edge of the valley bordered with a strip of the glaucus mountain Artemisiæ (A. tridentata), forming a band of white around the green, and it in turn surrounded by bushes of olive green. On account of the bluish-white foliage of this graceful bush it also might be used with great effect by landscape artists.

The Golden Rod is just coming into bloom, reminding me of autumn in New England, but scarcely in keeping are the fresh catkins of the "pussy-willow."

Patches of the beautiful deep red Zauschneria (Z. Californica) occasionally enlivens the dry slopes of some of these valleys.

A dead beef carcass, swarming with bees, just passed, is a reminder of the parable: "Out of the strong came forth sweet." Wild bees are abundant all through these hills, swarming among the rocks, in holes in the ground, and in one place they had attached their comb to a bush simply, not able to find even a vacant crevice for a lodging.

The great bee feed, the white sage, is abundant, but now out of bloom. Another great source of honey for the bees, the wild buck-wheat, (Eriogonum fasciculatum) is likewise nearly out of bloom, but its more modest congener, (E. Wrightii), is in full bloom, but the slender spikes of white blossoms might easily escape observation.

The cardinal mimulus is one of the striking flowers now to be found along the water courses, growing in large masses or bordering running streams with a profusion of showy flowers. It grows abundantly in moist places from a foot to four feet in height, with a light green, slightly sticky foliage.

Above it rise the tall slender stems of a species of wild sun flower (Helianthus Californicus), ten to a dozen feet in height, surmounted by golden disks.

Since writing the above I have followed up a little stream of clear running water, for a couple of miles and passed a lovely waterfall. Clumps of the tea fern are fresh and green, as also patches of selaginelia moss (S. rupestis). Willows border the creek, with occasionally a live oak tree, an elder or other species of trees or shrubs along the banks.

A species of wild lilac (Ceanothus) turns its leaves to the sun, conspicuous among the other shrubs for the silvery lustre on its foliage. As I approach Mexican Gulch, I find numerous clusters of the silver and the Cleveland ferns, both as green and fresh, owing to a recent shower, as they are in the spring.

The wild almond, the tree poppy, the oak-leaved cherry, the sugar tree (Rhus ovata), and manzanitas are among the other

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notable shrubs. The *floris de asusana* of the Mexicans, our own magnificent Romneya, is also abundant on these hills.

Among the cacti are to be found a species of Echino cactus, a wild tuna and a cholla, and the beautiful Cereus Engelmanni. The wild date (Yucca baccata) and the coyote plant (Y. whipplei) with Nolina Palmeri, the latter the sotote of the Mexicans, or vegetable soap, are all abundant.

Lovely beds of verbenas were abundant through Mexican Gulch, as beautiful as if they were cultivated in a hothouse.

Live oaks were not rare near the trail in places, and two varieties of scrub oaks were abundant, the Quercus pungens and Q. palmeri of botanists. The low bunches of Quercus pungens were frequently covered with small round galls of most beautiful and delicate coloring, red, white and green in different tints. The whole bush was frequently covered with these, which some very naturally mistake for the fruit of the shrub.

Juniper is perhaps the most abundant shrub near the mines and furnishes the main supply of wood at Alamo. It forms a low bushy tree, with dark green foliage, easily distinguished from the other brush at a distance. It would seem to be well adapted for cultivation as an ornamental shrub but may not prove desirable.

The color of the rocks in a landscape is often one of the characteristics of a country, and a no small factor in producing the pleasing effect upon the eye in the scenery of California is the great variety of rock lichens everywhere prevalent. Red, yellow, grey and white are the prevailing colors observable here, and the whole side of a cliff is often covered by lichens of the same tint. How many valuable mines may be hid from the prospector's keen eye by these deceptive colorings? Quartz, however, is not a favorite rock with the lichens and consequently is seldom concealed, while the lichens also frequently imitate in coloring the natural color of the rocks on which they are found.

C. R. Orcutt.

CONTRIBUTIONS TOWARDS A LIST OF THE FAUNA AND FLORA OF WET MOUNTAIN VALLEY, COLORADO. II.

(Compiled for the Colorado Biological Association.)

III.—MONOCOTYLEDONOUS PLANTS.

This list will be greatly augmented when the various species of grasses and sedges collected have been identified. For the Liliaceæ and Orchidaceæ it is probably fairly complete. For identifications we are indebted to the kindness of Dr. Geo. Vasey, Dr. J. M. Coulter, and Miss A. Eastwood.

1. Calypso bulbosa, L. Porter and Coulter, "Fl. Colorado." This is C. borealis, Salisb.

2. Corallorhiza multiflora, Nutt. Collected by Mrs. M. Howard of Ula.

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3. Listera convallarioides, Nutt. Near Short Creek (Mrs. M. E. Cusack.)

4. Habenaria hyperborea, R. Br. Common by creeks over 8,000 feet in the Sangre de Cristo Range.

5. H. dilatata, Gray. Porter and Coulter, "Fl. Colorado."

6. H. obtusata, Richardson. Collected by Mrs. M. E. Cusack.

7. Spiranthes romanzoffiana, Cham. Near Ula, in open damp ground, not rare.

8. Cypripedium parviflorum, Salisb. Near Swift Creek, etc.

9. Iris missouriensis, Nutt. Very abundant.

10. I. missouriensis albiflora, Ckll., sparingly with the type.

11. Sisyrinchium anceps, L., abundant in damp meadows.

12. S. anceps pallidiflorum, flowers very pale bluish, almost white. Near Ula, locally common.

13. S. mucronatum, Michx., near Short Creek, rather rare. Grows on drier ground than anceps, and is probably a variety of it.

14. Hypoxys juncea, Smith, found near West Cliff by Miss Eastwood.

15. Allium mutabile, Michx. Porter and Coulter, "Fl. Colorado."

16. Allium reticulatum, Fraser, id. loc. cit. We doubt whether this occurs below 10,000 feet.

17. Allium nuttallii, Wats. A species referred to this is found at West Cliff.

18. Allium cernuum, Roth, var., West Cliff.

19. Leucocrinum montanum, Nutt., common in early spring.

20. Yucca angustifolia, Pursh., very common.

21. Polygonatum canaliculatum, (Willd.), Pursh. From information received from Mrs. M. E. Cusack it appears that this grows near Brush Creek.

22. Smilacina amplexicaulis, Nutt., in herb. M. E. Cusack, collected in 1888.

23. Smilacina stellata, Desf., exceedingly abundant.

24. Streptopus amplexifolius, D. C., very common at about 8,300 feet.

25. Lilium philadelphicum, L., abundant.

26. Lilium philadelphicum pulchrum, Aldrich. With the type, rare.

27. Calochortus gunnisoni, Wats., abundant. A parasitic fungus (Vermicularia dermatium, Fr.) occurs upon it.

28. C. gunnisoni maculatus, Ckll.. frequent, being the form with the markings of the flower best developed.

29. C. gunnisoni immaculatus, Ckll., not rare, near Short Creek.

30. C. gunnisoni purus, Ckll., near Short Creek, often on drier ground than the other forms.

31. Veratrum californicum, Durand. Abundant, this year (1889) severely attacked by Puccinia veratri.

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32. Zygadenus elegans, Pursh. Common.

33. Zygadenus nuttallii, Gray. Porter and Coulter, "Fl. Colorado."

34. Luzula spadicea, D. C.

35. Luzula spadicea parviflora, Meyer.

36. Juncus balticus, Deth. Very abundant.

37. Juncus mertensianus, Meyer. Porter and Coulter, "Fl. Colorado."

38. Typha latifolia, L., id. loc. cit.

39. Sparganium simplex, Huds., id., loc. cit.

40. Lemna trisulca, L., West Cliff.

41. Lemna minor, L., West Cliff.

42. Cyperus filiculmis, Vahl.

43. Cyperus schweinitzii, Torr. Porter and Coulter, "Fl. Colorado."

44. Scirpus maritimus, L., id., loc. cit.

45. Eriophorum polystachyum, L., var., with channelled leaves. West Cliff.

46. Hemicarpha subsquarrosa, Nees. Porter and Coulter. "Fl. Colorado."

47. Carex douglasii, Boott. A species abundant in spring in open ground is referred with doubt to this.

48. Carex aurea, Nutt.

49. Carex echinata microcarpa, Bcklr. Porter and Coulter, "Fl. Colorado."

50. Andropogon scoparius, Michx.

51. Hierochloa odorata (L.)=borealis, R. and S.

52. Stipa spartea, Trin. Porter and Coulter, "Fl. Colorado."

53. Phalaris canariensis, L. West Cliff, introduced.

54. Danthonia sericea, Nutt. Porter and Coulter, "Fl. Colorado."

55. Phleum pratense, L. Cultivated, and occasionally an escaped casual.

56. Sporobolus depauperatus, Torr. Porter and Coulter, "Fl. Colorado."

57. Agrostis scabra, Willd.

58. Boutelona oligostachya, Torr. Very abundant on dry, open ground.

59. Catabrosa aquatica, Beauv. Porter and Coulter, "Fl. Colorado."

60. Poa andina. Common on open ground, spring.

61. Bromus ciliatus, L. Porter and Coulter, "Fl. Colorado."

T. D. A. Cockerell.

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CONTRIBUTIONS TO WEST AMERICAN BOTANY—II.

LENNOACEÆ.

PHOLISMA ARENARIUM, Nutt., Hook Ic. Pl. t. 626; Watson Bot. Calif., i., 464. A purplish-brown fleshy herb, parasitic on the roots of various shrubs, most commonly growing in sandy soil. The usually simple stems puberulent, an inch or more thick, clothed with small erect scales, three to six inches in height above ground and penetrating the earth or sand to a depth of three to twelve inches where connection is made with the foster root. Spike more or less capitate, dense, the purplish sessile flowers about four lines in length.

No doubt this plant like the Ammobroma, was utilized by the Indians for food, but the scarcity of Indians has prevented my verifying this supposition. It extends from near Montery (Douglas), southward to San Diego (Nuttall and others) into Lower California. C. G. Pringle collected it in 1882 on the roots of a species of Bigelovia in the Mojave Desert, San Bernardino county. I have found it in the vicinity of San Quintin bay, Lower California; in proximity to Quercus Dunnii, Kell.. in the mountains; and in other parts of the peninsular. It is found abundant near San Diego on the roots of Eriodictyon tomentosum, Benth., flowering in May, and I found it very plentiful on the Colorado Desert in April of this year (1889) and at intermediate points in the mountains.

AMMOBROMA SONORAE, Torr. Ann. Lyc. N. Y., viii., 51, t. 1; Watson, l. c. Dr. Edward Palmer re-collected this interesting plant this year at the head of the Gulf of California. It is a plant much resembling Pholisma in size and character, growing from twelve to eighteen inches deep in very sandy soil, and parasitic on the roots of several species of plants. The plant is watery and eaten raw by the Cocopa, Yuma and Diegeno Indians. Dr. Palmer describes the taste as resembling that of the heart of a cabbage. The original discoverer, Col. A. B. Gray, described the fresh cooked plant as "luscious, resembling the sweet potatoe in taste, only more delicate." It is also eaten by the Papago Indians, of Sonora, after roasting or drying in the sun. The Indians call it "sand-food" in their language, and in that arid region seek it on account of its juicyness. *C. R. Orcutt.*

BRIEFER ARTICLES.

(From Demorest's Monthly Magazine.)

MARIA MITCHELL.—The noted astronomer Maria Mitchell died at Lynn, Massachusetts, on June 28, of a brain disease from which she had been suffering from some time. The career of this talented woman began early in life and lasted an exceptionally long time. Miss Mitchell was born on the island of Nan-

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tucket, Massachusetts, on August 1, 1818. Her father was William Mitchell, a teacher and astronomer, and Maria, when only eleven years of age, became his assistant in his astronomical observations and computations, and acquired her education under her father's tuition, At eighteen years of age, Miss Mitchell was appointed librarian of the Nantucket Athenæum, which position she filled for twenty years. She still pursued her studies and researches in astronomy, and on October 11, 1847, she discovered a comet, and this discovery introduced the young astronomer to the notice of the world; she received a gold medal from the King of Denmark and a copper medal from the Republic of San Marino, Italy. In 1858 she visited Europe, and while there was the honored guest of Sir John Herschel and Sir George B. Airy, Le Verrier and Humboldt. The women of America, under the leadership of Miss Elizabeth Peabody of Boston, presented Miss Mitchell, upon her return, with a large telescope. In 1865 she was appointed Professor of Astronomy and Director of the Observatory at Vassar College, which post she retained until January, 1888, when she offered her resignation. This the trustees refused to accept, but granted her an indefinite leave of absence. She was employed in certain work for "The American Nautical Almanac" for some time, even after her appointment as a professor at Vassar. Of late years Miss Mitchell had made the study of sun-spots and the satellites of Jupiter and Saturn her special object. She was the first woman elected to membership in the American Academy of Arts and Sciences. In 1852 Dartmouth College conferred upon her the degree of LL. D., and Columbia honored her with the same degree in 1887. Her published writings were wholly upon scientific topics, if we except a few poems contributed to a book entitled "Sea-weeds from the Shores of Nantucket," published in 1853.

A Rival of Indian Corn.—A possible rival to Indian corn has been lately added to the fod-plants prooduced in this country. This new plant is called sweet cassava, and is closely related to the *Ricinus*, or castor-bean, which it resembles, although it is a handsomer plant than *Ricinus*. It bears very little seed, and is not propagated from seed, but from cuttings of the larger stems; and the roots produce great tubers, sometimes three or four feet in length, which seem to be a most wholesome article of food for men or cattle. By manufacture, cassava may be converted into starch, tapioca, aud glucose, with scarcely any waste. In the tropics, cassava flour is used for making crackers or wafers, which are very platable and will keep for months; and Florida housekeepers have used it for making bread, puddings, custards, etc., while as a vegetable it may be cooked in all ways that white potatoes are. On the southern border of the United States there are considerable areas admirably adapted to growing this remarkable plant as a staple article of home con-

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sumption; and its manufacture into starch, tapioca, and glucose, may become a leading industry in Florida. As to the yield per acre, no satisfactory estimate has yet been made; it will probably vary greatly under various conditions. A single plant has been known to produce fifty pounds of tubers, but this is exceptional. Certainly, however, the plant will yield enormously under favorable conditions, and its uses are so numerous that it cannot fail to soon become a staple product.

A BURIED CITY.—A buried city, hitherto unknown to the civilized world, has been lately discovered in Olancho, Honduras, and Mr. A. J. Miller has obtained from the Honduras government the exclusive right of excavation. The ruins were found in the new Department of Mosquito, about two hundred and fifty miles from the mouth of the Partook River. They may be approached only by the river, no path or track leading to them for miles. The Central American Indians of this region are the Peyas, but none of their traditions point to the existence of these ruins, which antedate the oldest civilization. The ruins, half-buried under the debris of ages and overgrown by a great forest, are about two miles square in extent, and show evidence of having been a city surrounded by a wall. Within the city was discovered an immense workshop where ancient Indian sculptors worked. Many beautiful designs in white granite—a stone which is found nowhere else in this immediate section of Honduras—have already been found. Immense tablets of stone, bowls on three legs, carved blocks of various sizes, weighing from twenty-five to six hundred pounds, urns and vases ornamented with curious hieroglyphics, or heads of snakes, turtles, tigers or rude human forms, were found among the relics. Further excavations will undoubtedly reveal still more rare treasures of great antiquity.

INTELLIGENT SWALLOWS.—France is threatened with a pecu liar calamity, and has been warned thereof by the Zoological Society. It seems that the fancy for using swallows as a millinery garniture has led to a line of campaign against them which the intelligent little migrators have noticed. Wires connected with electric batteries have been laid along the coast of the Department of the Bouches du Rhone, which is one of the great landing places for swallows coming from Africa, and the birds, wearied with their flight across the Mediterranean, perch upon the wires and are struck dead. Their bodies are then prepared for the milliner and sent by cratefuls to Paris. Thousands of swallows have been yearly disposed of in this way for some years; but this last spring the swallows demurred against this wholesale manner of electrocution, and landed further east and west. The gnats and other flying insects on which they live did not join in the boycott, however, and the loss to agriculturists threatens to be very serious unless the swallows again take up their summer quarters in France.

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ARTIFICIAL SILK.—An eminent French chemist, M. Chardonnet, has succeeded in producing a new textile fabric which bears the same relation to silk that celluloid does to ivory,—in short, an artificial silk. The production from celluloid of photographic films for the Eastman dry-plate process is one of the latest triumps in that line of manufactures, but this new material seems yet more wonderful. It is prepared from cellulose (cotton, or other available substance of that nature), which, after being treated with a mixture of nitric and sulphuric acids in equal proportions, as for the making of gun-cotton, is dissolved in a mixture of alcohol and ether, to which is added some perchloride of iron or protochloride of tin and tannic acid. The solution thus obtained is placed in a vertical vessel terminating in a small tube, or in a diaphragm pierced with fine holes, so that it can run out into a vessel full of water slightly acidulated with nitric acid. A fine fluid filament comes out from this, which immediately takes on a solid consistency and forms a thread which can be wound on a spool. The thread thus obtained resembles silk very closely, and has the same tenacious, elastic qualities. Water, cold or warm, has no effect on it, nor have acids and alkalies moderately concentrated. Any desired shade of color may be obtained by introducing coloring materials into the solution. One objection to this artificial silk is that it is extremely inflammable. Possibly this objection may be overcome by replacing the nitric acid with some other which will render it less combustible. When this is accomplished the new fabric will become useful.

FLOWERS IN ICE.—At expositions where medals of honor and prizes have been given for artificial ice, flowers may have been seen in ice. The exhibitor has had the children of the sun frozen in the ice to show how beautifully clear and transparent it was. But there are flowers that grow in the ice and unfold their blossoms there. To see such a wonder one must climb high in the Alps, to those regions where the glaciers are formed of the snow which becomes ice. The Alpine guides call the half-formed ice, *firn*. Coming in August to the edge of a firn-field, if fortune favors us we shall be surprised by a rare sight. Out of the snow fresh blooming flowers lift their heads, often in such quantities that ten or twenty flowers may be seen in the space of a square yard. One of these flowers especially attracts us,—the blue blossom of the soldanel. Its evergreen leaves grew on the earth beneath the sheet of firn; the stalks have been already prepared the year before, and have attained a scarcely perceptible height at a zero temperature. But when the summer sun again begins to melt the firn, and little rills of water flow under its covering, at a temperature never exceeding the point at which ice melts, the plant awakens to new life. The flower-stalks begin to grow buds, the warmth generated by the breathing of the plant melts the granular ice in the firn-field, and the soldanel

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bores a way through the ice, until its violet buds reach the upper surface and unfold into blossoms. But all the soldanels do not reach the surface; many of them remain prisoned in the ice, yet they do not perish. Cutting with ax and spade through the firn, single soldanels will be found, which have opened their blossoms before reaching the top. Such soldanels actually blossom in a little cavity in the ice, and resemble those plants or insects that are found embedded in amber or blown into glass balls. But the ice-flowers are alive, although they are somewhat crowded for room, and only push out their anthers while their petals remain folded. But if the soldanel blossoms are carefully taken out of their little ice-houses and their closed petals blown apart, the pollen may be seen to fly out.

SNIPE SURGERY.—An interesting account of how birds treat wounds by surgical methods was recently presented to the Physical Society of Geneva by M. Fatio. In this it was stated that the snipe had been observed to apply a dressing of feathers to wounds, and even to bandage a broken leg. Any creature with legs as long and brittle as a snipe's ought really to know how to take care of them. A case recorded of a snipe, both of whose legs had been broken by a misdirected shot, is the most interesting example of snipe surgery. The poor creature contrived to apply dressings of feathers and a sort of splint to both limbs, but unfortunately, in doing so, its beak got wound fast with feathers, and, as it could not use its claws to get rid of them and open its mouth, it was nearly dead from hunger when it was found. In another case, a snipe that flew away with a broken leg was afterwards found to have forced the fragments into a parallel position and secured them by a ligature of a kind of flat-leaved grass wound around the limb spirally and fixed by a glue-like substance.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

SAN FRANCISCO MICROSCOPICAL SOCIETY.—August 28, 1889. President Payzant occupied the chair. A large and interesting budget of current microscopical literature was added to the files.

The library was augmented by a number of valuable works on optics and microscopy, while the cabinet was enlarged by a series of mounted slides, mounting material and miscellaneous accessories, a gift from the society's late associate, F. L. Howard. The donation was accompanied by a letter from Mrs. Howard, setting forth the wishes of the departed member. A sincere vote of thanks and appreciation for the testimonial was tendered the lady by the members, and the collection will be known as The Howard Memorial.

Mr. Wickson presented a large collection of diatoms in situ, a donation from Professor George Davidson of the United States Coast and Geodetic Survey. They come from the northern end

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of Lopez Island, in Washington Sound, W. T., and will form a valuable addition to the society's working material. The diatoms were accompanied by a sample of supposed diatomaceous earth found near Santa Rosa. E. H. Griffith, of Fairport, N. Y., one of the society's corresponding members, donated a beautiful series of mounted slides, illustrating the gorgeous skeleton of the Diamond beetle or *Eupholus Linnei*. The glittering scales covering the body of this member of the weevil family form one of the most brilliant objects that can be presented to the eye under the microscope.

C. C. Riedy exhibited a large collection of mounted diatoms from the hand of the noted specialist in that line, C. L. Petticolas. A slide prepared by that gentleman of the recently discovered Redondo Beach earth found some miles south of Santa Monica, is thought by him to be fully equal to the celebrated piece discovered at Santa Monica several years ago and published to those interested in this branch of microscopical research by the investigations of the late Professor William Ashburner. Another remarkable slide in the collection exhibits what is known as the Eight-street Tunnel diatomaceous deposit of Richmond, Va., one of the finest deposits of strewn diatoms ever found. The slides of fossil marine diatoms from Syzran, Russia, and Kekko, Hungary, are also notable for the variety of their forms and the skillful manner in which they have been prepared before mounting.

A request from the Richmond Microscopical Society for an exchange of material was cordially responded to and the secretary instructed to effect the desired exchange.

F. W. Dunning of Battle Creek, Mich., forwarded a box of diatomaceous earth from Lyons creek, Calvert county, Md. The same gentleman also sent a sample of diatomaceous earth broken from a piece found by a fisherman some time in June last floating in the Pacific Ocean, about two miles off the coast of Santa Monica. The latter material will be examined and compared with the original Santa Monica diatoms to determine whether it contains the same variety of forms.

Dr. Riehl exhibited a pure culture of *Staphylococcus pyogenes aureus*; also, a stained and mounted specimen of same.

C. P. BATES,
Recording Secretary.

SANTA BARBARA SOCIETY OF NATURAL HISTORY.—August 31, 1889. Dr. L. G. Yates presented specimens of Helix Ayersiana, Newc., a land snail peculiar to the Channel Islands, and stated that he had planted a colony of these snails on the mainland near Montecito valley. Prof. H. C. Ford, the president, reported the discovery of a probably new species of bird in British Columbia, by Clark P. Streator.

A preliminary paper on the Geology and Natural History of the Anacapas was read by Dr. L. G. Yates, who exhibited beau-

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tiful specimens of chalcedonic quartz, showing cavities lined with drusy crystals, from the islands, and also amygdaloid basalt, the cavities of which were filled with fine chalcedony. Photographs of the scenery, insects and curiosities were also shown.

The president and corresponding secretary were appointed a committee on publication, to consider the question of issuing other bulletins.

L. G. YATES,
Corresponding Secretary.

NEVADA ACADEMY OF SCIENCE.—September 6, 1889. At this meeting a paper was read on the Circulation of Air Currents in Western Nevada, by Gen. C. W. Irish. This was the first working meeting of this new scientific association, organized at Reno, Nevada, with the following officers: President, Gen. C. W. Irish, Surveyor-General of Nevada; Vice-President, C. W. Friend, Director of Nevada State Weather Service; Secretary, Prof. R. D. Jackson, State University; Treasurer, Dr. J. M. Rankin, Bishop Whitacre's School for Girls; Executive Committee, Gen. C. W. Irish, Prof. R. D. Jackson, Dr. Le Roy D. Brown, Prof. W. McN. Miller, E. M. Van Harlengen.

W. S. DEVOL.

THE ASTRONOMICAL SOCIETY OF THE PACIFIC.—July 28, 1889. Lick Observatory, Mt. Hamilton. It was announced that the report of the solar eclipse of last January now being printed by order of the Regents of the University, had reached page 60, about a third of the volume. It contains reports from more than 150 persons distributed at twenty-five different observing stations.

C. F. Crocker has offered to bear the expenses of an expedition from the Lick Observatory to Cayenne, South America, next December, and it is expected at that time to confirm and extend some of the discoveries made at the last eclipse. The announcement was also made that Joseph A. Donohue of Menlo Park had founded a medal to be given for the discovery of comets, and had provided a permanent fund for the purpose. This gift was gratefully accepted by the society.

The papers read either by title or in full were as follows: "The Possibility of Photographing the Corona in Full Sunshine," by Mr. Keeler; "The Orbit of Comet Barnard," by Mr. Leuschner; and "The Occultations of Jupiter to be Expected in 1889," by Mr. Hall. A photograph of the Milky Way near Jupiter, taken the 24th inst., with one hour and forty-eight minutes exposure, was exhibited by Mr. Barnard. This picture was shown to illustrate "The Real Shape of the Nebulæ," by Mr. Holden. Its purpose is to show the real shape of the so-called spiral nebulæ in a space of three dimensions as deduced from their apparent shape as projected in two dimensions on the background of the sky. This is a problem that has had no solution up to this time, and it is one that has important bearings, not only

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upon the question of the construction of the spiral nebulæ, but also upon the much larger question of the constitution of the solar and stellar systems, and of the universe as a whole.

The affairs of the society are in a prosperous condition, owing to the great interest taken in its progress by the members. It is essentially a society for amateurs, and desires to include in its membership every person in California who takes an interest in astronomy, whether he has made studies in this direction or not. Several ladies are already members. The annual dues are $5 and there is no initiation fee. Life membership $50. The publications are sent to every member, and three of its six meetings are held in San Francisco. The scope of the society is defined so that it can have no possible rivalry with any other. Its sole object is to forward the study and the science of astronomy.

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C. C. PARRY.—Ceanothus, L., recent field notes, with a partial revision of the species. Proc. Davenport Academy of Natural Sciences, V. pp. 185–194. C. tomentosus, C. Lemmoni and C. Orcuttii are three new Pacific Coast forms described in this paper.

TH. RIBOT.—The Psychology of Attention. This interesting contribution to psychological literature, by the author of the "Diseases of the Will," the "Diseases of Memory," and the "Diseases of Personality," has, like them, been translated into English and presented in the Humboldt Library (28 Lafayette Place, N. Y). The present work, like the others, is a study of very recondite problems of psychology—the nature and workings of the mind of man—presented in language understandable by every intelligent reader, and is both instructive and highly entertaining.

SHERMAN F. DENTON.—Incidents of a Collector's Rambles in Australia, New Zealand, and New Guinea. Lee & Shepard, Boston, 1889. Price, $2.50. This very attractive volume of 272 pages, with numerous illustrations by the author, artist to the U. S. Fish Commission, Washington, D. C., consists of an entertaining narrative of a true naturalist's experiences, intermixed with notes on the birds, animals, insects and flowers of the lands visited. Many amusing anecdotes are related and altogether it is a delightful and instructive book to peruse—not "too scientific" for any reader.

E. L. BERTHOUD.—Birds, Their Migration and Uses. Golden, Colorado, 1887. 8vo. 22 pp. This little paper, just received from the author, treats of the geological history of birds, and especially of their economic and industrial relations to cereal and fruit culture.

HORACE F. CARPENTER.—A catalogue of the shell-bearing

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mollusca of Rhode Island, second edition, 1889. The list enumerates 216 species in the State.

P. C. REMONDINO.—The climate of Southern California in its relation to renal diseases. Reprinted from Southern California Practitioner. An able discussion of the effects of climate on health. The writer sums up his conclusions as follows: "The even equable temperature of insular regions, where for a whole year the weather is about alike in temperature, is the best and healthiest of climates. The localities where such a climate exists, with the temperature sufficiently low to meet all requirements, and at the same time having soil, sunshine, rainfall, winds and other climatic conditions favorable, are not many. There is possibly one place in the United States that such conditions obtain—a bit of country of about forty square miles, at the extreme southwestern part of the United States,' says Gen. Greely, Chief Signal Officer of the United States. One all important benefit of our climate not to be lost sight of is the fact that it is not a climatic season resort—*it has no season*—it is for the whole year—a fact that permits of removal to this region with a view to a permanent home as the rapid developments of its varied resources promises to make Southern California the home for millions of inhabitants."

EDITORIAL.

The earlier numbers of the WEST AMERICAN SCIENTIST are rapidly becoming rare. A few copies, especially numbers 1 and 2, are greatly desired to complete sets, and a liberal price will be paid by the publishers to anyone who can oblige us by supplying these.

The larger portion of September was spent by the editor in Lower California, revisiting many interesting localities. Several places were reached that had not before been explored and some remarkable discoveries were made. A fine species of Pinna was discovered measuring two and a half feet in length, fairly well preserved, with many other fossils. A species of Nautilus over two feet in diameter, at least four species of coral, and numerous other interesting fossil remains were discovered and will form material for future articles for this magazine.

NOTES AND NEWS.

The Ornithogists and Oologists' Directory, just issue by Messrs. Menefee & Corlees, San Jose, Cal., gives the addi sses of seventy-two collectors in California.

The National Magazine begins an existence in Chicago this month, as the organ of the National University, an institution said to be modeled after the London University, with extensive non-resident courses, teaching many subjects by mail. Published at 182 Clark street.

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New York, Chicago and St. Louis are rivals for the honor of the next great World's Exposition, which will commemorate the 400th anniversary of the discovery of America.

Wm. C. Strong, in Garden and Forest, favors transplanting evergreen trees in August instead of in spring. The latter method is often unsatisfactory.

A new powder has been invented in Europe, which in firing gives out but a slight vapor and hardly any report. Troops furnished with this smokeless and noiseless powder executed all movements with ease without annoyance of obscuring clouds of smoke.

A schooner recently picked up in the Atlantic ocean what resembled a chunk of grease floating in the water. It proved to be ambergris, worth thirty dollars an ounce. The mass weighed about fifty pounds.

Watches are now being made to run by electricity, that require no attention for a year after starting.

Typewriters will soon be placed on the market so small that one can carry one in his vest pocket without inconvenience. They will do as good work as the large and expensive machines, it is claimed, and will cost less than $2.50.

A young man in Virginia is reported to be absolute proof against electricity.

Henry Shaw, of St. Louis, founder of the Shaw Botanic Garde n, died recently at his home. The Agave Shawii, of San Diego, was named for him by his friend Dr. Engelmann.

The publishers of *St. Nicholas* announce that that popular childrens' magazine is to be enlarged, beginning with the new volume, which opens with November, 1889, and that a new and clearer type will be adopted. Four important serial stories by four well-known American authors will be given during the coming year.

During the coming volume *The Century* is to have an illustrated series of articles on the French Salons of the seventeenth and eighteenth centuries, including pen portraits of many of the leaders and a detailed account of the organization and composition of several historical salons. A great number of interesting portraits will be given with the series.

The Italian Admiralty have recently caused to be carried out a number of experiments with a view of testing the comparative merits of castor oil and olive oil for lubricating purposes on board ship. From the results obtained they have given orders that henceforth all exposed parts of machinery are to be lubricated exclusively with castor oil, while mineral oils are to be used for cylinder and similar lubrications.

Persons who have been experimenting as to the comparative value of trees in different localities are inclined to the opinion that the willow and the Norway spruce are the most valuable varieties for planting on the vast plains of the west for protection of crops and houses against destructive winds.

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IMPORTANT NOTICE.

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J. P. ABRAHAM,

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A VOICE from Ohio. Here is a portrait of Mr. Garrison, of Salem, Ohio. He writes: "Was at work on a farm for $20 a month; I now have an agency for E. C. Allen & Co's albums and publications and often make $20 a day." (Signed) W. H. GARRISON.

William Kline, Harrisburg, Pa., writes: "I have never known anything to sell like your album. Yesterday I took orders enough to pay me over $25." W. J. Elmore, Bangor, Me., writes: "I take an order for your album at almost every house I visit. My profit is often as much as $20 for a single day's work." Others are doing quite as well; we have not space to give extracts from their letters. Every one who takes hold of this grand business piles up grand profits. **Shall we start YOU in this business,** reader? Write to us and learn all about it for yourself. We are starting many; we will start you if you don't delay until another gets ahead of you in your part of the country. If you take hold you will be able to pick up gold fast. **☞ Read—** On account of a forced manufacturer's sale **125,000 ten dollar Photograph Albums** are to be sold to the people for $3 each. Bound in Royal Crimson Silk Velvet Plush. Charmingly decorated insides. Handsomest albums in the world. Largest Size. Greatest bargains ever known. Agents wanted. Liberal terms. Big money for agents. Any one can become a successful agent. Sells itself on sight—little or no talking necessary. Wherever shown, every one wants to purchase. Agents take thousands of orders with rapidity never before known. Great profits await every worker. Agents are making fortunes. Ladies make as much as men. You, reader, can do as well as any one. Full information and terms **free,** to those who write for same, with particulars and terms for our Family Bibles, Books and Periodicals. After you know all, should you conclude to go no further, why no harm is done.

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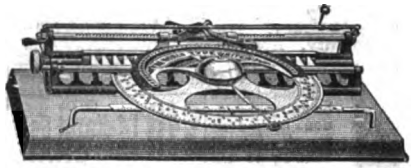

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THE WEST AMERICAN SCIENTIST.

VOL VI NOVEMBER, 1889. No. 49.

NOTES FROM THE SAN DIEGO BIOLOGICAL LABORATORY.

II.

ADDITIONS TO THE FAUNA OF CORTEZ BANKS.

In a trip to the Cortez Banks, subsequent to the one on which the fishes noted in the first part of these notes were collected, Captain Carter obtained the following species.

45. SPHYRNA ZYGAENA. (L.) August.

46. ECHENEIS REMORA. L. On Sphyrna zygaena.

47. DITREMA ATRIPES, Jordan & Gilbert. A single specimen of this species was caught with hook and line in 45 fathoms. August, 1889.

It differs somewhat from the description of atripes. The lips are black, a black spot at root of mandible. Pectorals hyaline, a narrow black bar at their base, especially well defined on their inner surface. Ventrals dusky, most so at tip. Upper third of first ten anal rays black. Caudal dark. Sides gray, lighter below, the back being bluish.

D. X, 22; A. III, 28½. Scales 7-70-15.

From D. orthonotus, this species differs in its arched back and less inclined anal basis.

48. CHROMIS PUNCTIPINNIS (Cooper)—A single specimen. It is undoubtedly identical with Cooper's Ayresia punctipinnis It differs from the specimens described by Jordan and Gilbert. (Syn. Fish. North Am. 611) in having the dorsal XIII, 11 instead of XII, 11 and the depth $2\frac{6}{7}$ instead of 2⅓. Since writing this, Dr. Jordan has examined a specimen in his collection with the dorsal as above XIII, 11 and the depth $2\frac{4}{7}$.

49. OPHIODON ELONGATUS Girard—One specimen from the Cortez Banks.

50. ZANIOLEPIS FRENATUS sp. nov. Type, one specimen, .165 m. Cortez Banks, Capt. Carter, Coll.

This species is very closely related to Z. latipinnis of Girard. It differs from that species in the less convex profile, the more slender shoulder, lower dorsal spines and color.

D. XX, 1-12; A. III, 16½; head 4⅓; depth 6¾.

General form of Z. latipinnis, the body less compressed, the dorsal outline less arched. Profile gently arched; nasal spines

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prominent. Eye longer than snout, 3 in the head. Mouth small, lower jaw included, maxillary reaching to the anterior margin of pupil. Three preopercular spines, the lowest flat, triangular, the others conical.

Second and third dorsal spines highest, $1\frac{1}{3}$ in length of head, the spines gradually shortened to the 20th. Ventrals reaching front of anal; pectorals scarcely to tip of ventrals.

Color in alcohol, olivaceous; suborbital and preorbital black, (the corresponding region in latipinnis, bluish silvery.) Dorsal and anal with large blackish spots; posterior half of pectorals dusky.

51. FIERASFER DUBIUS Putnam—A mass of larvæ and eggs imbedded in a transparent jelly-like matrix may be provisionally referred to this species.

ADDITIONS TO THE FAUNA OF SAN DIEGO, WITH NOTES ON SOME RARE SPECIES.

SPHYRNA ZYGAENA (L.)

MYCTOPHUM—Sp. A single specimen from the Cortez Banks which was referred to M. townsendi differs from that species in some respects. The occiput is more elevated, the preopercular margin is less inclined, agreeing with M. californiense. As far as evident, the sphosphorescent organs agree with those of townsendi; there is, however, no light area along the base of the anal. D. 13. A. 15. A single specimen of this species was taken out of the mouth of a Rock Cod caught a few miles off Point Loma.

MENIDIA TENUIS (Ayres)—This species has not been observed by us during the past year before Sept. 11th, when a large number were brought into the market. All the specimens examined by us have distinct bands of teeth and if the alleged absence of teeth in this species is the only character, as stated by Jordan and Gilbert., Syn., N. A. Fishes, 405, separating this species generally from Menidia, it must be placed in that genus.

ECHENEIS REMORA L.—Found on every specimen of Sphyrna zygaena.

XENISTIUS CALIFORNIENSIS (Steindachner)—Raspers.

This species has so far been very rarely found. Steindachner found it in San Diego Bay, (Ichthyol. Beitr. III. 3. 1875) and Streets at Cerros Island, (Bull U. S. Nat. Mus., VII. 49), since then the species has been noted but once, having been collected by Rosa Smith in '85. The specimens collected by her are now in the Museum of the Indiana University. On May 3d, '89 we procured a single specimen; the latter part of August and during September of this year they were very abundant about the wharfs in San Diego Bay, as many as twenty being caught in a day by a single person with hook and line. When they are pulled from the water they grate their pharyngeals together producing a noise like that of a rasp. Silvery below, steel blue above, lateral stripes rust color.

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RHACOCHILUS TOXOTES Agassiz—A single specimen. October 3d.

SEBASTICHTHYS MELANOPS (Girard)—Not rare in the markets in Summer and Fall.

SEBASTICHTHYS OVALIS Ayres—Not rare.

SEBASTICHTHYS RUBER (Ayres)—Not rare, usually large individuals brought to the market.

SEBASTICHTHYS LEVIS Eigenm and Eigenm—Equally abundant as S. ruber, none but large individuals seen.

SEBASTICHTHYS ROSACEUS (Girard)—Common.

SEBASTICHTHYS ELONGATUS (Ayres)—Not rare.

SEBASTICHTHYS RUBROVINCTUS Jordan and Gilbert—The rarest of the Rock Cods.

XYSTREURYS LIOLEPIS Jordan and Gilbert—Three specimens, Sept. 30th and Oct. 3d.

FISHES OF ÆTNA SPRINGS, NAPA COUNTY, CALIFORNIA.

PHOXINUS (Tigoma)CLEVELANDI sp. nov.—Types, three specimens .10-.12 m. to base of caudal. D. Cleveland, Coll.

Closely related to Ph. hydrophlox (Cope) associated with Leucus bicolor (Girard)

D. 9½; A. 10½; head 4-4¼; depth 3¾-4¼; teeth 2. 4—5 or 5,2; scales 10-59-6.

Mouth oblique, jaws equal, maxillary reaching front of eye or somewhat farther in the largest specimen. Eye 4-4¼ in head, 1½ in the interorbital space. Pectorals reaching ventrals in male, much shorter in female.

Color in alcohol; chocolate above, bordered ont he s des by a darker stripe; a black band from tip of snout to base of middle caudal running along the lateral line in front and on the tail, above the lateral line along the abdominal region; a light band from upper angle of eye between this and the dark of the back. Sides below the dark lateral band silvery, more or less peppered with black or chocolate. Dorsal and caudal dusky. Anal and ventrals light. the rays chiefly dusky. Upper surface of pectorals dusky, the color becoming more intense toward the outer ray which is black; lower surface of pectorals white. All markings most intense on male.

FISHES OF ALLEN SPRINGS, LAKE COUNTY, CALIFORNIA.

A few specimens were collected by Mr. D. Cleveland, at Allen Springs, Lake County, California.

PTYCHOCHEILUS OREGONENSIS (Richardson.)

SALMO IRIDEUS (Gibbons.)

URANIDEA SEMISCABRA CENTROPLEURA var. nov.

Two specimens .072 and .08 m. long.

Head 3½; depth 4¾ D. VIII, 17½; A. 14; V. I, 4. Pectorals 3-3¼ in length; ventrals 5, caudal 4.

Spinous dorsal pale at base and tip, the median region black. A band of prickles along the median line of the body to near pos-

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terior margin of anal; the rest of the body without villi or prickles. Lateral line complete. Ventrals reaching $\frac{2}{3}$-$\frac{4}{5}$ to vent, which is nearer to base of caudal than to tip of snout, otherwise as in semiscabra.

THE YOUNG STAGES OF SOME SELACHIANS.

SQUALUS ACANTHIAS L. Captain Carter of the Azalene obtained the young of this species from its mother in August. They were far along in their developement.

Total length .22 m; dimensions of the yolk. 02 x. 04 m The upper surfaces are blue, the lower white; a series of white spots along the sides. A light streak on sides above the ventrals. Anterior portions of dorsals black, the posterior margin and tip white. Upper margin of caudal and anterior margin of its lower lobe white; tip of upper lobe black; a white and then a black band between the black tip of the upper lobe and the anterior margin of the lower lobe. Upper basal portion of ventals dark blue, the remainder of the fin white. Pectorals largely blue above, the posterior margin being white, their lower surfaces largely white a median blue spot on its outer half. Snout broad and rounded.

TRIACIS SEMIFASCIATUS Girard. A female of this species about 1.5 m. long, caught Sept. 6, 1889, contained a number of young measuring .095-.105 m. Each embryo is surrounded by a delicate membrane filled with a hyaline watery albumen. The yolk is pyriform and measures .03 x. 07 m. In the smallest individuals the external gills are still present; the spiracular gills have, however, disappeared. In the proportions, position of find and coloration these embryos greatly resemble the adult. The asperities of the skin are entirely wanting. The ventral surface with the paired fins, the anal and lower lobe of the caudal are plain. A dark cross bar between the spiracles; three cross bars between this and the first dorsal fin, one on the middle of the first dorsal, another at its posterior margin, two between the dorsals, a dark cross bar on the anterior and posterior margins, of the second dorsal, four behind the second dorsal fin. In the larger specimens there is a spot on the middle of the lower caudal lobe and two or three along the sides anteriorly. The remaining color marks of the adult are not yet developed.

RHINOTRIACIS HENLEI Gill. A specimen of this species about 1.5 m. in length was caught off the wharf Sept. 7th, 1889. It contained six young, three in either uterus. They are .115 m. long and possess most of the characters of the adult. The tips of the caudal and dorsal fins and a median dorsal band behind the second dorsal are dark blue, otherwise the embryos are colorless. The external gills have disappeared. The umbilicus is very long .14 m. The yolk is bright yellow; it is intimately connected with the walls of the uterus. As the young of this species are attached by a placenta it may be generically distinguished Triacis from in which the young are free.

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GALEORHINUS ZYOPTERUS Jordan and Gilbert. This species is common in San Diego Bay, but, as with most sharks it is most abundant in the latter part of Summer. Few males are caught; all the specimens examined by us were females. Two individuals taken August 30th, 1889, were with young which average .05 m. in the one, .08 m. in the other. The yolk is a large spheroid measuring .05 x .08 m., and, as in the case of Triacis, is surrounded with a loose, delicate membrane. The embryos are colorless. The position of the fins agrees with the adult. All the young, including the largest, have external gills still persisting at the gill openings and spiracles. The head is comparatively shorter and broader than in the adult and the eye much larger.

SCYLLIORHINUS VENTRIOSUS Garman. On January 19th, 1885, Mrs. E. D. Buell hatched a shark from a flat egg case which she gave to Rosa Smith. The shark may be said to have been "hatched" although the embryo had not absorbed the vitelline sac and it may have been not quite matured as Mrs Buell pried open the case to let out the shark which was still alive. The shark was provisionally identified as Scylliorhinus ventriosus and the egg case sent to Mr. S. Garman to be figured.

The young shark differs from the description of the adult sharks in a few very prominent characters, i. e., the caudal is not continuous around the tail, the tip of the tail is margined by a series of flat spines and there is a series of rather strong spinelets along the sides of the back from in front of the second dorsal forward to the head. The central portion of the dorsal fins, the anal and the paired fins dark blue. Back and sides with dark blue double cross bars which are more or less interrupted, those of the tail extending upon both lobes of the caudal.

Length .085 m. Diam. of yolk about .02 m. Greatest depth .12 of total length; greatest width .14; length of head .17; width of head .18; length of snout .06; length of branchial area .09; width of mouth .14; distance from snout to first dorsal .49; length of base of first dorsal .07; length of caudal .26; length of pectoral .12; length of ventral .10.

C. H. & R. S. Eigenmann.

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*OBSIDIAN CLIFF.**

Obsidian Cliff is at the northern end of Beaver Lake, in the Yellowstone National Park, about eleven miles south of Mammoth Hot Springs. The cliff extends for half a mile, rising from one hundred and fifty to two hundred feet above Obsidian creek and falling away gradually to the north; the upper half is a vertical face of rock, the lower portion a talus slope of the same material.

The southern end is formed of nearly vertical columns of black

*) From the seventh annual report of the U. S. Geological Survey.

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obsidian, or volcanic glass, which has resulted from the rapid cooling of a perfectly fused, igneous rock. From this, great blocks have fallen and accumulated at its base in a talus slope, over which has been built what is popularly known as the glass road, the material of which it is made, being as true a glass as any artificially produced. The colors and structure of this natural glass not only make it the most interesting rock the visitor will find, but the phenomena of its occurrence in this locality are of special scientific importance.

What was the original thickness of this lava sheet it is not possible to say. The dense glass or obsidian forming the lower portion is from seventy-five to one hundred feet thick; the porous and pumiceous upper portion has suffered more or less erosion, which was in part the result of ice action, the evidence of glaciation being more marked along the lower western slope of the plateau than on the top of it. The surface of the plateau is mostly pumice, with little, if any glacial debris scattered over it; but along the western slope the rock has been worn down to the massive obsidian, and the top of the cliff is covered with planed and striated glacial drift from a great variety of sources.

Half a mile southeast of Obsidian Cliff, on the plateau, about five hundred feet above the level of Beaver Lake, is a circular pit one hundred feet deep, the mouth of it being three hundred feet wide by three hundred and fifty feet long; its sides stand at an angle of thirty-five degrees and appear to be formed of pumiceous obsidian, the angular masses in the bottom being pumice. The rim of the pit does not rise above the level of the surrounding surface, and one comes upon it quite unexpectedly in the timber. The general appearance is that of a small crater which has been but slightly affected by glaciation.

In the Solfatara Creek valley, the lava flow is exposed in a cliff the lower portion of which is black and red obsidian.

CONTRIBUTIONS TOWARDS A LIST OF THE FAUNA AND FLORA OF WET MOUNTAIN VALLEY, COLORADO.

(Compiled for the Colorado Biological Association.)

III ALGÆ.

The locality cannot be said to be rich in forms, although the irrigation ditches and creeks yield a certain number of species. Most of the species are of general distribution elsewhere. For identification we are greatly indebted to the Rev. F. Wolle, while one species was kindly named by Dr. W. G. Farlow.

1. Conferva vulgaris, Rab., near Ula.
2. Cladophora glomerata, Kg., well distributed; also found in Pueblo Co.
3. Mesocarpus scalaris, DeBy., near Ula.
4. Hyalotheca disilliens.
5. Draparnaldia plumosa, in Swift Creek, over 8,000 feet alt.

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6. Zygnema anomalum.
7. Spirogyra quinina, Ag., near Short Creek, 8,200 feet; West Clift.
8. Spirogyra nitida, West Cliff.
9. Oscillaria froelichii, Kutz.
10. " gracillima , Kg.
11. Vaucheria geminata, Short Creek.
12. " dichotoma, West Cliff.
13. Nostoc sphœricum.
14. " interruptum.
15. Navicula viridis, Kutz, near Ula.
16. " rhomboides, (Ehrenb), Greg, near Ula.
17. " dactylus, West Cliff.
18. Nitzschia amphioxys, Sm., near Ula.
19. Epithemia turgida, Sm., near Ula.
20. " gibba, Kutz, Short Creek, 8,200 feet alt.
21. Synedra ulna, Ehrenb., near Ula and Short Creek.
22. Gomphonema acuminata, Ehrb.
23. " dichotomum.
24. Cocconeis pediculus, common, and also found in Pueblo Co.
25. Fragilaria capucina, Sm., West Cliff and Short Creek.
26. Diatoma (Odontidium) hiemale, Kutz., Short Creek.
27. Closterium acerosum, Ehr., near Ula.
28. " leibleinii, Kutz.
29. " cucumis, Short Creek.
30. Cosmarium nitidulum, DeNot.
31. Euastrum ansatum, Ehr.

IV. PTERIDOPHYTA.

1. Botrychium lanceolatum, Angst., Willow Creek, 8,200 feet (M. E. Cusack.) A syrphid larva, about 10 mill. long, pale, the dorsum dull orange, was found on this plant.
2. Cryptogramme acrostichoides, (Spreng.) R. Br., Porter and Coulter, Fl., S. Colorado.
3. Woodsia oregana, Eaton, Porter and Coulter, "Fl. Colorado."
4. Pteris aquilina, Linn., somewhat local at about 8,400 feet alt.
5. Cystopteris fragilis, Bernh., Porter and Coulter, "Fl. Colorado."
6. Equisetum pratense, Ehrh., West Cliff.
7. Equisteum lœvigatum, Braun, Grape creek (Demetrio), Ellis and Everhart. This species has priority over E. lœvigatum, Lesqx, fossil at Golden. The fossil species may be amended to E. perlœvigatum, so as not to conflict with the recent one.
8. Equisetum arvense L , Willow creek and elsewhere. Some of the specimens are not typical.
9. Equisetum hiemale, L., Willow creek and elsewhere, common.

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V—GYMNOSPERMÆ.

1. Juniperus communis L., abundant at 8,200 feet and upwards. The berries form part of the food of robins (merula migratoria).
2. Picea engelmanni (Parry) Eng., Short creek and Willow creek.
3. Picea pungens, Eng., Short Creek and Willow Creek.
4. Pinus ponderosa var. scopulorum, Eng., abundant, Short Creek, Willow Creek, etc. *T. D. A. Cockerell.*

WEST CLIFF, October 7, 1889.

PRELIMINARY NOTES ON THE GEOLOGY OF THE ANACAPAS.

(Read before the Santa Barbara Society of Natural History, August, 1889.)

The group of islands known as the Anacapas are more exclusively of volcanic origin than any other of the Channel Islands, the base from the exposure above the level of the ocean being composed of black vesicular basalt, capped in many places by a trachytic rock of a more recent lava flow, and at some points on the most elevated portions of the islands covered by a drift formation, among which are found jasper, chalcedony, and other fragmentary metamorphic rocks.

Where these metamorphic rocks are found there is abundant evidence that the aborigines, who inhabited the islands, frequented the place of deposit for the purpose of selecting rocks suitable for the manufacture of their arrow and spear points.

An unimportant deposit of limestone exists on the middle island, and a vein of chalcedonic quartz was found near the eastern end of the larger island; this was also used for the manufacture of weapons and knives.

Amygdaloides of chalcedony are very abundant, filling the almond-shaped cavities in the basalt.

An article on the geology of the Channel Islands, including the Anacapas, with geological sections, the result of the studies of the islands during the past twelve years, is being prepared, and will be presented to this society at its next meeting.

There are many things connected with the fauna and flora of these islands which are of much interest to students of natural history, and the scenery equals in variety and grandeur many of the most noted localities of other countries, a fact which our local artists are making known.

The land shells of the islands are peculiar; the only helicoid land shell found on the Anacapas, Helix Ayresiana, heretofore noted from San Miguel, Santa Rosa and Santa Cruz, is found but sparingly on the Anacapas, but the writer brought a few living specimens and planted a colony in the foothills of the Santa Ynez Range, back of El Montecito, where it is hoped they may

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increase and furnish specimens of this beautiful snail for future generations of conchologists.

Owing to the steep and rugged shores, and a lack of suitable conditions, marine mollusks are not plentiful, except a few littoral species, which attach themselves to the rugged surface of the basalt rocks.

A list of the known mollusca of the islands is also in preparation.

We did not find any ferns upon the Anacapas, but, as adverse circumstances prevented our landing upon the western extremity of the group, where the conditions seem the most favorable for their growth, we cannot state positively that no ferns grow there. An article on the ferns of the Channel Island will shortly be published. *Lorenzo G. Yates.*

BRIEFER ARTICLES.

(From Demorest's Monthly Magazine.)

EARLIEST AMERICANS.—The knowledge that America was inhabited by a highly civilized people many centuries before its occupancy by the race of red men which the earliest European settlers found here, is not new. Yet it was not until lately that actual records of information concerning this people were found, and for more than four hundred years all that we have known of them was gathered from a careful study of the relics of their greatness,—the ruins of their edifices, which have been found scattered over the entire western hemisphere. But the earthen tablets found in Peru, Central America, and Mexico, engraved on plastic clay in perfect Phœnician characters, and afterwards burned to render them imperishable, extend back nearly two thousand years before Christ. Accordng to these records, these people, the Toltecs, came from some remote country and settled in South America. They were an eminently civilized and religious people, vesting the laws of their government and their theology in the same persons, and believing in one God, the creator and ruler of all, and in a mediator (Tzuma) who was to come to guide and teach them aright. Two distinct classes existed among them, the "Olptecs," or workers, and the "Orptecs," or thinkers, the latter including not only their priests and rulers, but their architects, artisans, engineers, and nobility. The "Olptecs" were serfs with no voice at all in the government or public affairs. These people rapidly increased, and by the year 400 B. C. had settled nearly the entire South American continent and spread over Mexico, where they found an aboriginal race dwelling on the banks of the streams and living upon the natural produce of the soil and upon fish and game. For over a thousand years the Toltecs occupied the land, until in the last century before Christ, the Aztec invaders sailed up the Amazon, claiming to have come from an Oriental country which they called "Aztlan." The Aztecs soon overruled the Toltec government, and in the course of two or three centuries the Aztecs were the dominant people.

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Their supremacy lasted for seven centuries, and then, through luxurious abundance, their commerce and industries became less active and extensive, and their power commenced to wane. In 800 A. D. a savage horde from the north and west came down upon the Aztecs, and wiped out the primeval civilization in a savage war of extermination, lasting for years. The remnants of the stricken people fled to the mountains, where they became cliff and cave dwellers, and others became amalgamated with the destroying race, the Chicimecs. This is but a sketch of the wonderful history these long-hidden records relate. It was reserved for the progressive and enduring Indo-European branch of the Aryan race to open the pages and read for us the instructive history of these thirty forgotten centuries during which America was peopled in turn by the Hamitic branch of the Semite race, then by the Semites proper, and these finally exterminated by the fierce Turaneans from Chinese Tartary, until to-day nearly every vestige of their existence is being crushed out of the world's history by the rapid paces of an advancing civilization.

COMMUNISM IN OHIO.—In Tuscarawas county, Ohio, about eighty miles south of Cleveland, in a quaint little village called Zoar, is an obscure communistic colony of about three hundred inhabitants. It was founded in 1817, by two Germans, who selected this location, comprising some of the richest land in Ohio, and called their settlement Zoar, because it was to be to them a place of refuge from the world. The people, descendants of the pioneers who first settled there, are frugal and industrious, strongly attached to their beautiful home, and work for the community, which owns and controls not only the village proper but thousands of acres outside. The money is received into one common treasury, and the necessaries of life, including food and clothing, are furnished by the officials, consisting of three trustees and a committeee of five, who are annually elected by ballot. They are Christians, accepting the Old and New Testaments, but they have no minister or ceremonies of any kind, and their place of worship is not called a church, but a 'congregation-house.' In marriage, the contracting parties procure a license, according to the laws of the State, and the marriages are solemnized by a Justice of the Peace, who is a member of the community. Years ago their rules were very strict, and the members all dressed alike; but now, although simplicity is the rule, they are not uniformly attired. They manufacture their own wool garments, and boots and shoes, and each family raises its own produce. If any need money for any reason, they make application for it. They run a flouring mill, two grist mills, two woolen mills, and a tannery. They have two good schools, and keep a large hotel accommodating many summer boarders. Altogether they are a happy, independent people, content to live apart from the world. Every person in the community knows his place, is assigned to his duty, and performs his work according to his ability. Nearly all the present members were born in

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Zoar, although outsiders may join if they can pass satisfactorily the year's probation which is demanded. Yet this quiet, secluded life does not seem to accord with the desires of most men and women, although the Zoarites profess to be perfectly satisfied.

THE SALT MOUNTAINS OF THE COLORADO.—Upon a tributary of the Colorado River, the Virgin, are situated the salt mountains which are destined to be the source of great wealth to someone. They cover a stretch of about twenty-five miles on both sides of the Virgin River, seven miles up from the Colorado. The salt they contain is pure and white, and clearer than glass, and it is said that a piece of it seven or eight inches thick is sometimes clear enough to see through to read a newspaper. Over the salt is a layer of sandstone from two to eight feet thick, and when this is torn away the salt appears like a huge snowdrift. How deep it is has not yet been ascertained; but a single blast of giant powder will blow out tons of it. Under the cap-rock have been discovered charred wood and charcoal, and matting made of cedar bark, which the salt had preserved, evidently the camp belongings of prehistoric men. The rocks toward the salt mountains are painted and carved with hieroglyphics, the meaning of which is known only to the Mojave, Yuma, Piute and other Indians. From the reports of recent explorers it seems that there are stretches of hundreds of miles on the Colorado River as little known as the heart of Central Africa. The walls of the El Dorado Canyon, where the river is three hundred and fifty feet wide, are so high that neither the sun nor the moon can shine in. The Colorado is the greatest field for explorers on the North American Continent beside the Arctic regions, and the wonders yet to be unearthed there will probably much more richly reward the attention of the scientist than even the unknown spaces of the frigid North.

THE CABLE CIRCUIT OF AFRICA.—The report of the United States Vice-Consul to St. Paul de Loando, concerning the district of Mossamedes, on the West Coast of Africa, practically an unknown country to Americans, includes the important information that a cable has just been laid between the Cape of Good Hope and Mossamedes, touching at Port Nolluth, and continued from Mossamedes to Loando, completing the telegraphic circuit of Africa. It is expected, since the completion of this new line, that a message can be sent *via* the West Coast more expeditiously than by the old route to the Cape *via* the Red Sea and Zanzibar. The district of Mossamedes, of which a considerable portion of territory has been lately ceded by Portugal to Germany, is situated between 13° 50′ and 17° 25′ south latitude. The principal port and town is called Mossamedes. It has anchorage for any number of vessels, and good pier facilities. Its commerce chiefly consists of the exchange of cattle, dried and salted fish, dried beef, and agricultural products for goods and provisions that come from Europe. A line of railway from Mos-

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samedes to two hundred miles into the interior has been projected. It will cross the Schella Mountains at a distance of one hundred and twenty miles from the coast, beyond which the country is said to be magnificent, and salubrious for Europeans, who are able to work in the fields.

MODERN CAVE-DWELLERS IN GERMANY.—Cave-dwellers in civilized Europe? It seems incredible; and yet, just above the thriving village of Langenstein, in the Hartz Mountains, and forming a part of it, are about ten dwellings hewn in the rocks. They are called the "Burg," or "castle," and here some forty persons have their home. In the face of the solid rock is to be seen a row of regular-shaped doors and windows, one door and one window belonging to each dwelling. The most ancient of these dwellings is the work of a young married couple whose extreme poverty gave them no other choice than to seek a home in the rugged mountain-side. Their work must be held deserving of respect, for it was no light task to pick away the rock bit by bit, as one workman must with no tool but his pick-ax. Through the doorway one enters a narrow, straight hallway, at the right of which another doorway leads into a good-sized room with a window, the only one in the dwelling. Opposite this doorway, at the left of the entry, is a shell-shaped hollow, which serves as a sleeping-room, in which, however, straw supplies the place of a bed. Back of this, at the left, is a store-room; opposite it, adjoining the living or sitting-room, is the kitchen, with fireplace and chimney; and back of the kitchen is another sleeping-room. The latter has no opening for light, yet, as the house-door is usually open the greater part of the year, there is light enough to see by. The walls are of the natural rock, and the apartments are perfectly dry, and not badly ventilated with the door, window, and chimney, which create a slight draft through the dwelling at all times. The place is warm in winter and cool in summer, and the inmates are rosy and healthy. Some of the cave-dwellers have whitewashed their houses, and made little gardens outside, so that the exterior does not display a forbidding appearance. At any rate, these cave-dwellings are quite as comfortable (and certainly more sanitary) habitations as the cellars of our cities, which are leased to wretched inmates, and are only caves of masonry.

A WONDERFUL LAKE.—'The 'Walled Lake,' as it is called, is the greatest wonder in the State of Iowa. It is situated in Wright county, twelve miles north of the Dubuque and Pacific Railway, and one hundred and fifty miles west of Dubuque City, and occupies a surface of two thousand eight hundred acres, with a depth of twenty-five feet in some places The lake is from two to three feet higher than the earth's surface, and in some places the wall surrounding it, which gives it its name, is ten feet high. The stones used in its construction vary in weight from one hundred pounds to three tons, and the wall is fifteen feet wide

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at the bottom and five feet wide on top. The mystery about the lake is that no one knows who built these massive walls that inclose it, or where the stone was obtained from, unless they were taken from the immediate vicinity; for surrounding the lake, to the extent of five or ten miles, there are no stones, although everywhere else in Wright county there are plenty of them. Another singular fact is that, although the water in the lake is always clear and fresh, no one has been able to ascertain where it comes from or where it goes.

AN ELECTRIC PLANT.—In the forests of India there has been discovered a very strange plant, which manifests a most astonishing magnetic power. Anyone who breaks a leaf from it receives immediately a shock equal to that which is produced by the conductor of an induction coil. A magnetic needle at a distance of twenty feet is affected by it, and near by becomes very much deranged. The intensity of this singular influence is very variable. It is most powerful about two o'clock in the afternoon, and almost without force at night or during rain. No bird or insect is ever seen to alight on the electric plant; some instinct seems to warn them of the danger of sudden death. None of the magnetic metals, iron, cobalt, or nickel, are found where this plant grows, so that the electric force undeniably belongs exclusively to the plant. The mysteries of light and heat, magnetism and electricity, make the leaf and blossom of this wonderful Indian plant a rare botanical problem.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

(San Diego Society of Natural History, October 4. 1889.)

The meeting was held at the residence of the Vice-President, Rev. B. F. McDaniel. Dr. C. H. Eigenmann made some remarks on his trip in the Azalene to the Cortez Banks, describing the embryology of the rock cods and the surf perches, both of which bring forth their young alive. The vice-president presented fine specimens of Indian relics from El Cajon valley, describing the locality whence they came. Tourmaline in quartz was scattered over the hillside and it was evident the Indians had mined there for flints for arrow heads.

BIBLIOGRAPHY.

MALVA ROTUNDIFOLIA. The occurrence of this imported weed in a pasture at Trinidad, Colorado, is announced in *Field and Farm*, September 21, 1889. It is exceedingly abundant in some localities in the East, as at Niagara Falls, but we had not definite news of it before in Colorado. T. D. A. C.

JOSEPH P. NUNN. The Fertility and Coloring of Birds' Eggs. *Science Gossip*, September, 1889, p. 204. Statistics are given of

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various clutches of *Merula merula*, and the author concludes that "the greater the fertility, the darker the color of the eggs."

THE MAMMOTH NOT EXTINCT. In *Science Gossip*, September, 1889, p. 214, is quoted a clipping from the *Saturday Journal*, to the effect that the mammoth (*Elephas primigenius*) still exists in Alaska! A certain Mr. Fowler, it seems, has interviewed a man who killed two of them. But the public unkindly scoffs and makes mention of the horse marines!

DIORCHIDIUM TRACYI, DE TONI. *Journ. of Mycol.*, June, 1889, vol. 5, p. 95 and pl. x. Good figures are given of this species from New Mexico, which is the only North American species of its genus known. We confess, however, that we do not quite see on what grounds it is called D. tracyi, since it was apparently first described by Tracy and Galloway as Puccinia verti-septa, last year. The name ought surely to be Diorchidium verti-septa, (T. & G.), verti-septa not being preoccupied or otherwise inappropriate. Dr. De Toni's ideas of priority are, we hope, not those of most other mycologists. The same number of the *Jour. of mycol.* that contains the description of P. verti-septa has an article on Doassansia by him in which he proposes to alter D. punctiformis (Niessl, 1872) to D. Niesshi, De Toni, because an Australian species was named D. punctiformis by Winter in 1887, D. punctiformis Niessl not being at that time recognized as belonging to the genus! It is the Australian D. punctiformis, Wint., that must be changed—say to D. Lythri, as it was found on Lythrum. T. D. A. C.

R. K. MACADAM. North American Agarics. *J. of Mycol.*, June, 1889, p. 58. Descriptions and localities are given for 11 species of Russula, only three of which are quoted from anywhere on the Pacific Slope. There is probably a great deal yet to be done amomg the Western Agarics. T. D. A. C.

H. J. ELWES. Notes on genus Erebia. Trans. Entomological Society of London, 1889, p. 317. This very interesting paper deals with this genus of butterflies at considerable length, and gives a list of the species. There are also remarks on the geographical distribution of the genus, which number altogether 57 species. A new var. brucei of E. epipsodea is described from Colorado. It is smaller, without ocelli, and the red band is almost obsolete. It is possibly a distinct species. T. D. A. C.

D. W. COQUILLETT. The Imported Australian Ladybird, (Vedolia cardinalis). *Insect Life*, Sept. 1889, p. 70. Of this article on the imported Australian Coccinellid, and the wonderful work it is doing in destroying that pest, the Icerya, in California, we need only say that it is of the greatest interest, and ought to be read by all who care for the welfare of agriculture on the Pacific Slope. T. D. A. C.

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EDITORAL.

The development of a system for the utilization of the arid lands of the west is one of the most promising of numerous projects now under consideration for the material improvement of the condition of mankind. Not only is the west interested in the numerous discussions and actions taken on this subject, but the whole nation is becoming awakened to the necessity of rendering this vast area capable of sustaining human life.

It has been estimated that within historic times some seven millions of square miles along the shores of the Mediterranean, once highly fertile, have been changed into worthless deserts, and for nearly 2,000 years the inhabitable portion of the earth has decreased at the average rate of 3,500 square miles. This has been produced by the direct agency of man, the evil being chiefly due to river floods caused almost exclusively by the destruction of land-protecting forests.

It is right that America should set the example of reclaiming desert lands and thus increase earth's capacity for supporting the human race. *Irrigation and tree-culture must go hand and hand in this work.*

The value of irrigation has been abundantly proved by the past experience of the human race and is to-day sufficiently demonstrated in Southern California to convince the most skeptic. Not only is irrigation recognized in the west as the solution of the arid lands question, but agricultural papers are already pointing out the desirability of the system for the eastern States, where it is much less vital and was long considered needless.

The necessity for tree-culture is equally imperative with irrigation, and the arid lands question will never be satisfactorily settled without the recognition of this principle in its solution. The men who advocate the construction of a vast system of storage reservoirs for irrigation purposes, refuse to recognize the value of mountain forests as natural storage reservoirs and distributors of the water supply, and hold that it would be just as well to destroy them entirely, are not the men needed in this exigency of our country. The system of irrigation proposed is well, but if left to their own devices in the latter respect, the country will have reason for regret. America can ill afford to ignore the experience of other nations in this respect and forestry should receive equal consideration with irrigation.

NOTES AND NEWS.

An event anticipated in Plymouth for more than fifty years took place there on the 1st of August. It was the dedication of the

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monument in honor of the Pilgrims, by the Masonic Grand Lodge which laid the corner-stone thirty years ago.

The four hundredth anniversary of the discovery of America by Columbus will be celebrated by a World's Fair in 1892. New York city is confident of being selected as a site for this great exposition, but Chicago and St. Louis are both rivals for this honor. St. Louis claims to be more centrally located than any other city of its size in the United States, and to possess a greater population and two and a half times as many miles of railroad within a radius of 500 miles, than either New York or Chicago.

Rev. M. J. Berkeley, a distinguished English cryptogamic botanist, is dead.

Prof. F. H. Knowlton is collecting fossil plants in Western New Mexico, Arizona and California, according to the *Botanical Gazette.*

Prof. E. L. Greene spent the summer months in an exploration of the forests of Colorado, Montana, Oregon, Washington and California.

Dr. George Vasey has returned to Washington, D. C., from his tour through the West.

There are about 100 species of mosquitoes in the world, occurring in all climes. Eight or ten species have been known to inhabit England for more than fifty years—in fact since they were first studied—and no new species have been recorded in Britain in that time. One well-known British species has been recorded from Mexico; though no tropical species has ever visited England

Dr. Field, a celebrated physician, is reported to have used nothing but common flour of sulphur, a teaspoonful mixed with the finger in a wineglassful of water, and given as a gargle, when diphtheria was raging a few years ago. In ten minutes the patient was out of danger, and he never lost a case of this disease. Sulphur destroys the fungus in man and beast. In extreme cases dry sulphur was blown down the throat through a quill, and sulphur burned in a shovel so that the patient could inhale it, when a gargle could not be used.

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A VOICE from Ohio. Here is a portrait of Mr. Garrison, of Salem, Ohio. He writes: "Was at work on a farm for $20 a month; I now have an agency for E. C. Allen & Co's albums and publications and often make $20 a day." (Signed) W. H. GARRISON.

William Kline, Harrisburg, Pa., writes: "I have never known anything to sell like your album. Yesterday I took orders enough to pay me over $25." W. J. Elmore, Bangor, Me., writes: "I take an order for your album at almost every house I visit. My profit is often as much as $20 for a single day's work." Others are doing quite as well; we have not space to give extracts from their letters. Every one who takes hold of this grand business piles up grand profits. **Shall we start YOU in this business,** reader? Write to us and learn all about it for yourself. We are starting many; we will start you if you don't delay until another gets ahead of you in your part of the country. If you take hold you will be able to pick up gold fast. **☞Read—** On account of a forced manufacturer's sale **125,000 ten dollar Photograph Albums** are to be sold to the people for $3 each. Bound in Royal Crimson Silk Velvet Plush. Charmingly decorated insides. Handsomest albums in the world. Largest Size. Greatest bargains ever known. Agents wanted. Liberal terms. Big money for agents. Any one can become a successful agent. Sells itself on sight—little or no talking necessary. Wherever shown, every one wants to purchase. Agents take thousands of orders with rapidity never before known. Great profits await every worker. Agents are making fortunes. Ladies make as much as men. You, reader, can do as well as any one. Full information and terms **free,** to those who write for same, with particulars and terms for our Family Bibles, Books and Periodicals. After you know all, should you conclude to go no further, why no harm is done.

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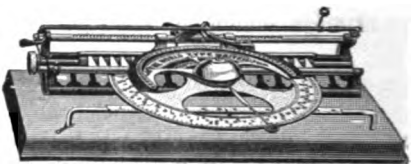

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